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STRUCTURE OF THE AIR FORCE'S JOB PERFORMANCE MEASUREMENT SYSTEM AND PREDICTABILITY OF THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB)

Terry L. Dickinson

Old Dominion University
Department of Psychology
Norfolk, Virginia 23529-0267

Mark S. Teachout

TRAINING SYSTEMS DIVISION
Brooks Air Force Base, Texas 78235-5601

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AIR FORCE SYSTEMS COMMAND
BROOKS AIR FORCE BASE, TEXAS 78235-5601

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HENDRICK W. RUCK, Technical Advisor
Training Systems Division

RODGER D. BALLENTINE, Colonel, USAF
Chief, Training Systems Division

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Terry L. Dickinson
Mark S. Teachout

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8961 Tesoro Drive, Suite 600
San Antonio, Texas 78217

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The present research employed the Air Force's Job Performance Measurement System (JPMS) to assess the validity of the Armed Services Vocational Aptitude Battery (ASVAB) for predicting job performance in eight Air Force specialties. The conceptual structure of the JPMS was partially confirmed with factor analyses. A factor for technical proficiency and factors for the three rating sources (i.e., supervisor, self, and peer) were found. The remaining factors varied by specialty, but they typically were a merging of an interpersonal proficiency factor with one of the rater source factors. The technical proficiency factor, as well as its defining measures (i.e., work sample tests and job knowledge tests), correlated with the ASVAB for seven of the specialties. Although these validity correlations were modest in magnitude, they indicate that the ASVAB does predict hands-on job performance. In contrast, the rater source factors showed an inconsistent pattern of validity correlations, indicating that rating measures cannot be recommended for validating the ASVAB. Finally, the training outcome of school grades was predicted very well by the ASVAB for all specialties, even when predictability for the technical proficiency measures was removed from the validity correlations.

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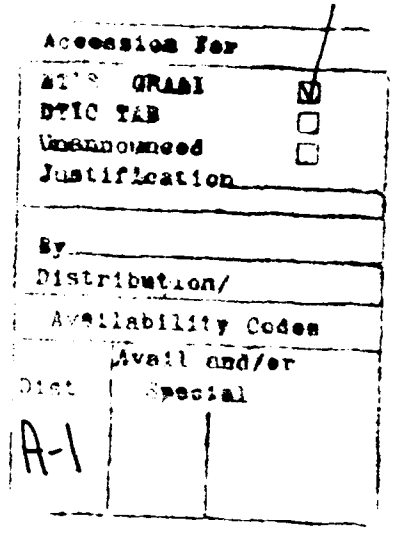
Terry L. Dickinson

Old Dominion University
Department of Psychology
Norfolk, Virginia 23529-0267



Mark S. Teachout

TRAINING SYSTEMS DIVISION
Brooks Air Force Base, Texas 78235-5601

Reviewed and submitted for publication by

William E. Wimpee, Major, USAF
Chief, Training Assessment Branch
Training Systems Division

SUMMARY

The validity of the Armed Services Vocational Aptitude Battery (ASVAB) was demonstrated for the Air Force's Job Performance Measurement System (JPMS) for seven of eight Air Force specialties. Although the validity of the ASVAB was modest in comparison to its validity for training school grades, the results indicated that the ASVAB does predict hands-on job performance.

PREFACE

This work was conducted in partial fulfillment of Contract No. F41689-86-D-0052 awarded to Universal Energy Systems Incorporated, with the Air Force Human Resources Laboratory (AFHRL). It complements the AFHRL Training Systems Division efforts in job performance criterion development by investigating the structure of the Air Force's job performance measurement system and the predictability of the Armed Services Vocational Aptitude Battery for that system.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

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STRUCTURE OF THE AIR FORCE'S JOB PERFORMANCE MEASUREMENT SYSTEM AND PREDICTABILITY OF THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB)

I. INTRODUCTION

A major goal of the Air Force's Job Performance Measurement project is to develop a measurement system to use for validating the Armed Services Vocational Aptitude Battery (ASVAB). The validity evidence for using the ASVAB to select and classify incumbents into Air Force specialties has been developed previously from training performance criteria (e.g., Wilbourn, Valentine, & Ree, 1984). These training criteria were the grades that students received to reflect their success in technical training prior to being assigned to their initial, specialty position. Unfortunately, training school grades are an indication of the potential for job performance and only indirectly relate to actual on-the-job performance.

A Congressional mandate directed the Armed Services in 1980 to establish research programs to validate the ASVAB directly against job performance criteria (Wigdor & Green, 1986). This mandate recognized the indirect nature of the validity evidence previously accumulated for the ASVAB. In response to this mandate, the Air Force Human Resources Laboratory initiated systematic research on several methods and procedures to develop a job performance measurement system (JPMS).

An initial version of the measurement system was developed and applied to four Air Force specialties (cf. Hedge & Teachout, 1986): Air Traffic Control Operator (AFS 272X0), Avionic Communications (AFS 328X0), Information Systems Radio Operator (AFS 492X1), and Jet Engine Mechanic (AFS 426X2). Subsequently, the measurement system was expanded to include job knowledge tests of technical proficiency. This expanded system was applied to four additional specialties: Aerospace Ground Equipment Mechanic (AFS 423X5), Aircrew Life Support (AFS 122X0), Personnel (AFS 732X0), and Precision Measurement Equipment Laboratory (AFS 324X0).

The purpose of the present research effort is to describe results for the application of the Air Force's JPMS to the eight specialties. The technical approach required assessment of the: (a) conceptual structure of the job performance measures and (b) predictability of the ASVAB for the job performance measures.

Conceptual Structure of the Job Performance Measures

Job performance is a complex concept, consisting of several dimensions that are predicted by many human attributes. This complexity requires multiple measures of job performance that are homogeneous in content and relatively independent of each other (Dunnette, 1963; Guion, 1976). Such multiple measures clarify the conception of job performance, and thereby, enhance the understanding of predictors of job performance.

The Air Force's JPMS emphasizes the classification of job performance. The broadest classification defines the content of job performance to reflect either the (a) technical or (b) interpersonal aspects of work (Kavanagh, Borman, Hedge, & Gould, 1986). At the next level of classification, the technical and interpersonal components are classified by dimensions (Dickinson, Hedge, & Ballentine, 1987). Each dimension still reflects technical or interpersonal performance. However, the conception of performance is enriched by the delineation of technical and interpersonal performance into dimensions.

One type of dimensional classification emphasizes a task-oriented description of job performance. It relies on the job analyses developed and maintained by the Air Force's Occupational Measurement Center. These job analyses are used to sample tasks in order to develop a relevant and measurable description of job performance.

The task-oriented dimensions are subclassified by tasks. Each dimension is described by a set of interrelated tasks that reflect the content of that dimension. Further, the tasks can be also subclassified into steps that reflect the elemental or "correct" versus "incorrect" aspects of task performance.

A second type of dimensional classification emphasizes a trait-oriented description of job performance. The trait-oriented description emphasizes aspects of job performance that are relatively independent of work content, but still important to job success. This description draws on organizational norms that reflect the qualities and standards appropriate for measuring each member's contribution to the Air Force.

The Air Force's JPMS also emphasizes the usage of multiple methods and sources for job performance information (Kavanagh et al., 1986). Methods are the procedures for obtaining information, and they include testing and rating. Sources are the individuals who provide the information, and they include test administrators, supervisors, incumbents, and peers. The Air Force uses test administrators to collect information with work sample and job knowledge tests, and it uses supervisors, incumbents, and peers to obtain information with rating procedures.

Armed Services Vocational Aptitude Test Battery

The Armed Services began uniform testing in 1950 with the use of the Armed Forces Qualification Test (AFQT). The AFQT was used as a measure of general trainability to set standards for entry into the Armed Services (U.S. Department of Defense, 1985). A sample of officers and enlisted men, who served in the military during 1944, was used to establish the percentile scores for setting enlistment standards. These scores were utilized until October 1984 to make enlistment decisions.

The ASVAB (i.e., Forms 6 and 7) was first used in 1976 by all of the Armed Services for selection and classification. Prior to that date, earlier forms of the ASVAB were used for (a) high school testing programs by the Armed Services, (b) selection and classification only by the Air Force and Marine Corps, or (c) experimental purposes. Subsequent to uniform ASVAB testing by the Armed Services, additional forms have been developed. Forms 8, 9, and 10 were used from 1980 through 1984. Those forms appearing after 1984 are parallel to Forms 8, 9, and 10. Currently, Forms 14, 15, 16, and 17 are in operational use.

In 1980, a nationally representative sample of young people was administered ASVAB Form 8a (U.S. Department of Defense, 1982). The Form 8a scores of this representative sample were used to develop new percentile norms for ASVAB Forms 8 and above. The new norms were used to set enlistment standards after October 1984.

II. METHOD

Participants

Job performance data were collected between the years 1985 and 1987 on 1,613 first-term (i.e., 1 to 48 months of total active military service) job incumbents from the eight specialties.

These job incumbents were stationed at 63 US Air Force bases located in the United States, Great Britain, Europe, and the Philippines.

Sample sizes varied between the specialties because of the number of personnel assigned to each specialty and the convenience of testing available personnel. Further, sample sizes varied within each specialty according to the job performance measure due to missing observations or incomplete data. Nonetheless, the maximum sample sizes were as follows: Air Traffic Control Operator (N = 191), Avionic Communications (N = 98), Information Systems Radio Operator (N = 157), Jet Engine Mechanic (N = 255), Aerospace Ground Equipment Mechanic (N = 261), Aircrew Life Support (N = 191), Personnel (N = 197), and Precision Measurement Equipment Laboratory (N = 138).

Job Performance Measures

Job performance information was obtained with testing and rating procedures. The testing procedures provided information on technical proficiency, while the rating procedures provided information on technical and interpersonal proficiency.

Walk-Through Performance Testing

One testing procedure employs work sample tests and is referred to as Walk-Through Performance Testing (WTPT).[1] This procedure includes traditional hands-on performance tests that are administered by trained personnel (Hedge & Lipscomb, 1987). For example, a hands-on test for a jet engine mechanic requires the incumbent to install a starter on a jet engine. As the starter is installed, the test administrator uses a checklist to indicate whether each task step is performed correctly. The WTPT procedure also includes interview performance tests that are administered systematically by trained personnel. For example, an interview test for a jet engine mechanic requires the incumbent to explain the step-by-step procedures that must be employed to install a starter on a jet engine. This verbal explanation is done at the work site such that the explanation can be supplemented with gestures to appropriate tools or equipment in order to clarify the procedures. The distinction between the hands-on and interview tests is clear. A hands-on test emphasizes "can do" the task, while an interview test emphasizes "knows how to do."

The use of interview tests was required, because many tasks cannot be measured with hands-on tests due to safety, time, or cost constraints. In addition, the interview testing procedure was seen as a potential substitute or surrogate for the more expensive hands-on procedure.

The number of tasks measured with WTPT ranged from 15 (i.e., Jet Engine Mechanics, AFS 426X2) to 26 (i.e., Aerospace Ground Equipment Mechanics, AFS 423X5). The hands-on and interview tasks required from less than a minute to 45 minutes to complete. In total, WTPT required from 3 to 7 hours to complete, depending on specialty.

Performance for some tasks was measured only with a hands-on or interview procedure, while performance for other tasks was measured with both of the procedures (Hedge, Teachout,

[1] WTPT may refer interchangeably to Walk-Through Performance Testing, the process, or to Walk-Through Performance Test, the instrument.

& Laue, 1990). Thus, several performance scores were available from WTPT. In the present research, the total scores for unique hands-on and interview tests were used for analysis. In addition, a total WTPT score was used, and it was calculated as the sum of scores for all hands-on tests plus those scores for the unique interview tests.

The development of the WTPT measures relied heavily on input from subject matter experts (SMEs) at each phase of the process. The first phase in WTPT development involved task selection. For each specialty, the current Occupational Survey Reports and information on the technical school curricula were used initially to screen tasks that were performed by first-term airmen. Tasks were selected that were (a) performed by at least 30% of the first-term airmen, (b) included in the technical school curricula, and (c) most critical to first-term airman performance. Additional tasks were selected that were associated with specific equipment (e.g., type of jet engine) or workcenter (e.g., engine repair in the shop or on the flightline). The result of task selection was the identification of (a) a primary list of 20 to 30 tasks that described major aspects of a first-term airman's job performance and (b) an alternate list of tasks to be used for replacement of primary tasks eliminated later in WTPT development.

The second phase of WTPT development required validating the task selection. Over a period of four to five days, SMEs met in a workshop to assess the appropriateness of the selected tasks. Tasks from the primary list were eliminated, because they were obsolete, similar in performance requirements to other tasks, not routinely performed, or difficult to observe. When SMEs eliminated a task, a parallel task from the alternative list was chosen randomly as a replacement. The final product of this workshop was a list of tasks that was used not only for the development of WTPT measures, but also for the development of job knowledge and rating measures.

The third phase of WTPT development required task analysis to determine for each task the (a) suitability for hands-on and interview testing (e.g., availability of equipment), (b) step-by-step performance requirements, and (c) tools and equipment configuration needed for testing. For each specialty, task analysis was conducted by interview and observation. Visits were made to various Air Force bases to meet with SMEs and to observe task performance by first-term airmen.

Next, WTPT tests were constructed for each of the tasks. The mix of the tests was targeted to be 50% of the tasks measured only with the hands-on procedure, 25% only with the interview procedure, and 25% with both.

The fifth phase of WTPT development required validating the test construction. A group of SMEs met in a workshop to review and revise the tests. Tests were examined for the clarity of instructions and the validity of task performance steps. In addition, the tests were sequenced for their order of administration.

After this workshop, the hands-on and interview measures were pilot tested in a field setting. Procedures, directions, performance steps, and time limits were examined, and if appropriate, revisions were made to the tests.

The seventh phase of WTPT development was a test scoring workshop that was conducted with SMEs to determine the relative importance and criticality of each test and its performance steps. This information was used to develop weighting schemes for each test as well as a weighting scheme for the total WTPT score.

Finally, test administrators were selected and trained. All test administrators were required to be either active duty or recently retired SMEs to ensure their technical expertise and familiarity with the Air Force. The training was extensive and focused on practice in administering, evaluating, and scoring the hands-on and interview tests. Videotape materials were used for

practice and to illustrate correct and incorrect step-level performance. Further, WTPT measures were administered in pretest, field settings to provide a "dress rehearsal" prior to full-scale data collection.

Job Knowledge Measures

These measures were paper-and-pencil tests that were developed simultaneously with the hands-on and interview tests (Bentley, Ringenbach, & Augustin, 1989). The content of the job knowledge tests corresponded closely to that of the WTPT measures, since the job knowledge tests were seen as potential surrogates for the WTPT measures. Sets of items were written for a job knowledge test to measure the tasks that were covered by the WTPT measures. The items were written and reviewed by several groups of SMEs in workshop contexts. The job knowledge test was administered in the pretest, field setting along with the WTPT measures to gather data for item analysis. These data were used to eliminate poor items and reduce test length to meet time constraints.

Rating Measures

Ratings were obtained for all of the classifications of job performance from supervisors, incumbents, and peers. Many of the decisions that guided the format and content of the rating measures were made in the developmental efforts associated with the Jet Engine Mechanic specialty (AFS 426X2). This was the first specialty for which the JPMS was developed.

The task rating form provided the most specific rating data. This rating form contained task statements for all of the tasks measured by the hands-on and interview tests, plus tasks that were eliminated during the WTPT developmental process due to time or logistical constraints. The task statements were rated with 5-point scales anchored with adjectives on each point. The task ratings *only* for the task statements corresponding to the hands-on and interview tests were used in the present research. These ratings were averaged to obtain an indication of technical proficiency at the task level of classification.

The task-oriented dimensional rating form required supervisors, incumbents, and peers to rate technical proficiency on task-oriented dimensions. Potential dimensions were identified through factor analysis of occupational survey data. In a series of workshops with SMEs, the dimension definitions and representative tasks were discussed, and 5-point rating scales were constructed for each dimension. Behavioral descriptions for each of the five points were developed using the behavioral summary statement approach advocated by Borman (1979). The dimension scores were averaged to obtain an indication of technical proficiency using task-oriented dimensions.

The trait-oriented dimensional rating form was developed to be representative of all specialties in the Air Force. It focuses on eight traits that distinguish effective performers across all jobs. This Air Force wide form was constructed by a group of "resource managers" in the Air Force who had managerial responsibilities for a large number of specialties. They were able in discussion to (a) compare the performance requirements of several specialties and (b) reach consensus on an inter-specialty perspective of performance. In addition, the managers developed 5-point rating scales that were anchored with behavioral summary statements. The dimensions were: (a) technical knowledge/skill; (b) initiative/effort; (c) knowledge of and adherence to regulations/orders; (d) integrity; (e) leadership; (f) military appearance; (g) self-development; and (h) self-control. For the trait-oriented rating form, the technical knowledge/skill dimension was used to indicate technical proficiency, while the remaining dimension scores were averaged to indicate interpersonal proficiency.

The global rating form was developed to measure technical and interpersonal proficiencies needed for successful performance. The two items were also developed in a workshop setting. The two types of proficiency were discussed and defined, and the behavioral summary approach was used to place specific behavioral descriptions on 5-point scales.

ASVAB Measures

The ASVAB scores for the participants were obtained from their personnel records. These scores included values for the ten ASVAB subtests, the AFQT, and the four Air Force composites (i.e., Mechanical, Administrative, General, and Electronics) used to classify personnel to a specialty.

Four of the ASVAB subtests (i.e., Arithmetic Reasoning, Numerical Operations (half weighted), Paragraph Comprehension, and Word Knowledge) are combined to form the AFQT.

The Air Force's composites for classification are formed from combinations of the ten ASVAB subtests as follows: Mechanical (Mechanical Comprehension, General Science, Auto/Shop Information (double weighted)), Administrative (Numerical Operations, Coding Speed, Word Knowledge, Paragraph Comprehension), General (Word Knowledge, Paragraph Comprehension, Arithmetic Reasoning), and Electronics (Arithmetic Reasoning, Mathematics Knowledge, Electronics Information, General Science).

The eight specialties examined in this research were distributed uniformly across the four classification composites. Thus, the Mechanical composite included Jet Engine Mechanic (AFS 426X2) and Aerospace Ground Equipment Mechanic (AFS 423X5) specialties; the Administrative included Information Systems Radio Operator (AFS 492X1) and Personnel (AFS 732X0); the General included Air Traffic Control Operator (AFS 272X0) and Aircrew Life Support (AFS 122X0); and Electronics included Avionic Communications (AFS 328X0) and Precision Measurement Equipment Laboratory (AFS 324X0).

Participants with incomplete ASVAB data, and those tested with Forms 5, 6, or 7 were eliminated from the samples. Since Forms 5, 6, and 7 are normed to the 1944 reference population, they could not be compared to Forms 8 and above which are normed to the 1980 reference population. Test scores from Forms 8 and above were transformed to a common metric using available equating formulas.

Final Training School Grades

Final grades received in technical training school were also available from the personnel records. Since final training school grades have typically been used to describe the validity of ASVAB predictors, they served as a comparison criterion for the JPMS measures. These grades ranged from 70 to 100, with 70 being the minimum passing grade. Approximately four percent of the students enrolled in technical school in the Air Force fail to receive a passing grade (Wilbourn et al., 1984).

III. RESULTS

Assessment of Job Performance Measures

The focus of these analyses is a construct-oriented evaluation of the job performance measures for each of the eight specialties. Such a focus yields information necessary to judge the appropriateness of each performance measure for validating the ASVAB. The analysis approach included factor analyses of the measures to assess the Air Force's conception of job performance as well as a comparison of the structures obtained from the eight specialties. In addition, the rating forms were used in regression analyses to predict performance on measures from WTPT. These regression analyses determined whether the less expensive rating forms could serve as substitutes for the WTPT measures. Finally, the rating forms themselves were compared to assess supervisors, incumbents, and peers as sources of rating. The comparisons required (a) analyses of variance with post hoc comparisons to determine mean differences among the rater sources and (b) multitrait-multimethod analyses to determine the amount of method bias due to rating sources as well as the validity of trait- and task-oriented dimensions for describing job performance.

Factor Analyses

The Air Force's conception of job performance logically leads to an expected factor structure. For each specialty, two general performance factors were expected to reflect technical and interpersonal proficiencies. In addition, four method factors were expected that reflected the type of measurement procedure. One method factor was that of testing, as reflected by WTPT and job knowledge measures. Method factors were also expected for the rating measures. Based on rating source research (e.g., Holzbach, 1978; Klimoski & London, 1974; Lawler, 1967, 1975; Tsui & Ohlott, 1988), a separate method factor was expected for supervisory, self-, and peer ratings.

The maximum likelihood procedure was used to extract factors; this procedure tends to produce the most accurate estimates of population parameters (Gorsuch, 1974). The scree test and number of eigenvalues greater than 1.00 were used as criteria to determine the number of factors (Gorsuch, 1974). Using these criteria, only five factors were extracted for each specialty; the sixth (i.e., testing method) factor was not obtained for any specialty. Subsequently, the extracted factors were rotated analytically using oblimin with delta specified to equal zero (Jennrich & Sampson, 1966; Norusis, 1986). The nature of these five factors and their intercorrelations were similar across the specialties. The factor titles are displayed in Table 1. The factor structure and factor correlation matrices for the eight specialties are reported in Tables A-1 to A-16 in Appendix A.

The interpretation of the factors employed general rules. First, larger loadings were inspected (e.g., an absolute value of .700 or greater). Such loadings accounted for 49% or more of a measure's variance and were likely to characterize the content of a factor. Second, smaller loadings were inspected (e.g., an absolute value from .500 up to .700). These loadings could also characterize the content of a factor, providing that the measure had very small loadings on the remaining factors (e.g., -.300 to .300). Third, the pattern of loadings on a factor was used for interpretation. For example, if the absolute values of peer measure loadings tended to be greater than those of other types of measures, the factor was characterized as a peer factor.

Four highly similar factors were found. The most prominent of the factors was a technical proficiency factor. As expected, the measures that characterized the technical proficiency factor were the hands-on and interview components of WTPT as well as the job knowledge measure.

Moreover, inspection of the loadings in Tables A-1, A-3, A-5, A-7, A-9, A-11, A-13, and A-15 reveals that rating measures which reflected technical proficiency loaded higher on that factor than rating measures which reflected interpersonal proficiency.

The three remaining prominent factors reflected supervisory, self, and peer points of view. For seven of the eight specialties, the supervisory factor was characterized by high loadings by all supervisory measures, regardless of technical or interpersonal content. For all specialties, the self factor was characterized by high loadings by all self-rating measures. For six of the eight specialties, the peer factor was characterized by measures with high loadings by all peer measures.

Table 1. **Titles of the Factors by Specialty**

Specialty	Factor				
	I	II	III	IV	V
AIRTRAFF	TECH	SUPER	SELF	PEER	PEER-TEC
AVIONIC	TECH	SUPER	SELF	PEER-TEC	PEER-INP
ISRADIO	TECH	SUP-TEC	SELF	PEER	SUP-INP
JETMECH	TECH	SUPER	SELF	PEER	INPERS
AEROSPACE	TECH	SUPER	SELF	PEER	PEER-TEC
AIRCREW	TECH	SUPER	SELF	PEER	PEER-TEC
PERSON	TECH	SUPER	SELF	PEER-TEC	PEER-INP
PRECISE	TECH	SUPER	SELF	PEER	SELF-TEC

Note. Abbreviations for the specialties are: AIRTRAFF, Air Traffic Control Operator; AVIONIC, Avionic Communications; ISRADIO, Information Systems Radio Operator; JETMECH, Jet Engine Mechanic; AEROSPACE, Aerospace Ground Equipment Mechanic; AIRCREW, Aircrew Life Support; PERSON, Personnel; and PRECISE, Precision Measurement Equipment Laboratory. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER, overall performance from a peer point of view; PEER-TEC, proficiency on technical aspects of work from peer point of view; SUP-TEC, technical proficiency from supervisory point of view; SUP-INP, proficiency on interpersonal aspects of work from supervisory point of view; PEER-INP, proficiency on interpersonal aspects of work from peer point of view; SELF-TEC, proficiency on technical aspects of work from incumbent point of view as contrasted with supervisor and peer points of view; and INPERS, overall proficiency on interpersonal aspects of work from supervisory, incumbent, and peer points of view.

The supervisory and self factors had small positive correlations with the technical proficiency factor (i.e., .026 to .383), while the peer factor had small positive and negative correlations (i.e., -.158 to .361) with the technical proficiency factor. An exception to these patterns occurred for the Aerospace Ground Equipment Mechanic specialty. For this specialty, all factors correlated negatively (i.e., -.158 to -.341) with the technical proficiency factor.

Further, the supervisory and self factors tended to correlate positively with each other, while both had negative and positive correlations with the peer factor.

The fifth and final factor was complex and changed in its nature by specialty. This factor was characterized with loadings by peer, supervisory, and interpersonal measures. The Jet Engine Mechanic specialty provided the most interpretable solution, and its results serve as reference for the remaining specialty results.

As shown in Table A-7, the Jet Engine Mechanic factor structure indicates that the fifth factor reflected interpersonal proficiency. This interpersonal factor is characterized by moderate loadings by all interpersonal measures. Further, as shown in Table A-8, this factor has small

correlations with the rater source factors (i.e., supervisory, self, peer), and it has a small negative correlation with the technical proficiency factor.

The Air Traffic Control Operator specialty did not provide an interpersonal proficiency factor. As shown in Table A-1, a peer-technical factor was obtained. This factor was characterized by high loadings on task and dimension peer ratings. In contrast to other specialties, the peer and peer-technical factors correlated negatively with other factors. Apparently, in this specialty, interpersonal proficiency was not a distinct aspect of performance.

The Avionic Communications specialty was characterized by two peer factors that represented technical and interpersonal points of view. Although the peer technical factor had moderate loadings by supervisory and self measures of technical proficiency, this factor was dominated by the peer point of view (see Table A-3). The peer interpersonal factor had moderate loadings from supervisory measures of interpersonal proficiency, but it was also dominated by the peer point of view. As shown in Table A-4, the peer technical factor had the largest correlation (i.e., .328) with the technical proficiency factor, and the peer interpersonal had the smallest (i.e., .160).

The Information Systems Radio Operator specialty provided a factor that reflected a supervisory point of view of interpersonal proficiency. As shown in Table A-5, the two measures that characterized this factor were supervisory ratings of interpersonal proficiency on the Air Force wide and global forms. For this specialty, supervisory ratings were separated into technical and interpersonal points of view. Interestingly, the supervisory technical factor had the greater correlation with the technical proficiency factor (i.e., .383 versus -.115).

The Aerospace Ground Equipment Mechanic and Aircrew Life Support specialties had a fifth factor that reflected technical proficiency from a peer point of view (see Tables A-9 and A-11, respectively). This factor was characterized primarily by the task and dimension rating measures. As shown in Tables A-10 and A-12, this peer technical factor correlated negatively with technical proficiency (i.e., -.389 and -.315, respectively).

The Personnel specialty had two peer factors. One factor reflected technical proficiency from the peer point of view, while the second peer factor reflected interpersonal proficiency. As shown in Table A-14, both peer factors correlated negatively with technical proficiency (i.e., -.273 and -.130, respectively).

Finally, the Precision Measurement Equipment Laboratory specialty had a fifth factor that reflected technical proficiency from the incumbent point of view (see Table A-15). As shown in Table A-16, this factor correlated negatively with technical proficiency (i.e., -.232). Interestingly, the supervisory and peer interpersonal measures loaded modestly on this factor *but with a sign opposite* to the incumbent technical measures. Thus, for this factor, incumbents who rated themselves as low on technical proficiency measures were likely to be rated as high on interpersonal proficiency measures by supervisors and peers.

Prediction of WTPT Measures by Rating Form Composites

The rating forms were used to predict WTPT performance for each specialty. For each rating form, multiple regression analyses were completed using three composite predictors. These predictors were averages of ratings provided by supervisory, self-, and peer raters. For example, the task level rating form for the Air Traffic Control Operator specialty contained 15 tasks that were rated by supervisory, self, and peer sources. The 15 ratings were averaged for each source to form a composite rating. The three composite task ratings were then used to predict total, hands-on, and interview performance in separate multiple regression analyses. The squared multiple correlations for the specialties are reported in Tables B-1 to B-8 of

Appendix B. These correlations reflect the extent to which the rating form composites explain WTPT performance.

A summary of squared multiple correlation results is reported in Table 2. Averages of the WTPT correlations were computed for each rating form and each specialty by transforming the correlations to Fisher's Z values, computing their averages, and then transforming the averages back to correlational values. As shown in Table 2, the task and dimension composites were better predictors of WTPT performance than the Air Force technical and global composites. However, none of the rating forms was adequate in predicting WTPT measures. These results suggest that rating forms should not be considered as substitutes or surrogates for the WTPT measures.

Table 2. **Specialty Averages of Squared Multiple Correlation Coefficients for Supervisor, Self, and Peer Composite Predictors of WTPT Measures Obtained with Task, Dimension, Air Force-Wide Technical Knowledge, and Global Technical Proficiency Rating Forms**

	Rating Form			
Specialty	**Task**	**Dimension**	**Air Force**	**Global**
AIRTRAFF	.083	.082	.066	.056
AVIONIC	.127	.143	.141	.084
ISRADIO	.088	.147	.149	.140
JETMECH	.114	.153	.113	.117
AEROSPACE	.174	.174	.156	.183
AIRCREW	.089	.069	.019	.043
PERSON	.147	.120	.073	.125
PRECISE	.154	.157	.150	.083
Average	.122	.131	.108	.104

Note. Averages were computed from Tables B-1 through B-8 for total, hands-on, and interview measures obtained with walk-through performance testing.

Rater Source Mean Bias

The supervisory, self-, and peer ratings for each rating form in each specialty were compared with a one-way, repeated measures analysis of variance. These analyses determined whether the rater sources differed in mean bias (i.e., relative leniency or severity) by rating form and specialty. For example, the 15 tasks in the Air Traffic Control Operator specialty were each analyzed to determine if the rater sources differed in mean values.

If the analysis of variance F-test indicated that the source means differed significantly ($p < .05$ or $p < .01$), post hoc comparisons were computed among the means using Fisher's least-significance-difference (LSD) approach. Thus, the means were compared with t-tests using a level for significance (i.e., $p < .017$ or $p < .003$) determined by the number of possible comparisons (i.e., 3) divided into the stated level of significance for the F-test. Fisher's LSD test is quite conservative (Winer, 1971; p. 201), and it probably led to an understatement of the number of significant mean differences. However, the pattern of significant differences is

important and not the number of those differences. The numbers of significant differences are reported in Tables C-1 to C-8 of Appendix C.

The general pattern of the significant mean differences suggests that self-ratings tended to be greater in magnitude than supervisory and peer ratings. Further, there was a tendency for peer ratings to be greater than supervisory ratings.

Multitrait-Multimethod Validity of Rating Forms

The construct validity of each rating form was assessed with a multitrait-multimethod analysis (Dickinson, 1987). The traits in these analyses corresponded to the constructs appropriate to the rating form. For example, the task level form had tasks as traits, while the dimensional level form had dimensions as traits. The methods in all analyses were the rating sources (i.e., supervisory, self, and peer raters). For each specialty, the analyses utilized the measure intercorrelations as specified by the trait and method combinations. These analyses are contained in Appendix D in Tables D-1 to D-32.

The multitrait-multimethod analyses are summarized in Tables 3, 4, and 5. These tables report the extent of convergent and discriminant validity as well as method bias of each rating form for each specialty.

As shown in Table 3, the convergent validity was moderate (cf. Dickinson, Hassett, & Tannenbaum, 1986). This validity reflects the ability of the measures to describe individual differences in performance. The measures were equally effective for the specialties. However, the dimensional level rating forms appeared to possess greater convergent validity than the remaining rating forms.

Table 3. **Convergent Validity of Rating Forms by Specialty**

	Rating Form				
Specialty	**Task**	**Dimension**	**Air Force**	**Global**	Average
AIRTRAFF	.259	.295	.276	.194	.256
AVIONIC	.236	.286	.212	.213	.237
ISRADIO	.261	.326	.250	.200	.259
JETMECH	.195	.350	.280	.265	.272
AEROSPACE	.214	.266	.272	.328	.270
AIRCREW	.194	.234	.265	.290	.246
PERSON	.151	.197	.204	.216	.192
PRECISE	.212	.256	.225	.250	.236
Average	.215	.276	.248	.244	

As shown in Table 4, there was also a moderate amount of method bias (cf. Dickinson et al., 1986). Of course, method bias is undesirable as it indicates that supervisory, self, and peer raters view incumbent performance differently. The specialties did not differ in method bias. However, the Air Force wide rating form had less method bias. Perhaps this was due to the generic nature of Air Force wide traits.

Table 4. **Method Bias of Rating Forms by Specialty**

	Rating Form				
Specialty	**Task**	**Dimension**	**Air Force**	**Global**	Average
AIRTRAFF	.316	.250	.261	.288	.279
AVIONIC	.274	.230	.152	.246	.226
ISRADIO	.288	.258	.159	.293	.250
JETMECH	.280	.230	.231	.260	.250
AEROSPACE	.285	.245	.220	.278	.257
AIRCREW	.334	.271	.256	.281	.286
PERSON	.234	.247	.282	.192	.239
PRECISE	.254	.258	.232	.227	.243
Average	.283	.249	.224	.258	

As shown in Table 5, there was little evidence for discriminant validity (cf. Dickinson et al., 1986). The traits did not appear to describe different aspects of incumbent performance. Further, the specialties did not differ in discriminant validity, but the Air Force-wide and global rating forms did produce somewhat greater discriminant validity. The greater validity by these rating forms was probably due to their measurement of both technical and interpersonal proficiency.

Table 5. **Discriminant Validity of Rating Forms by Specialty**

	Rating Form				
Specialty	**Task**	**Dimension**	**Air Force**	**Global**	Average
AIRTRAFF	.057	.067	.090	.085	.075
AVIONIC	.092	.014	.165	.136	.102
ISRADIO	.032	.015	.173	.090	.078
JETMECH	.104	.061	.124	.096	.096
AEROSPACE	.073	.071	.083	.062	.072
AIRCREW	.077	.075	.089	.027	.067
PERSON	.093	.047	.099	.165	.101
PRECISE	.067	.032	.118	.136	.088
Average	.074	.048	.118	.100	

In sum, the rating forms possess similar multitrait-multimethod properties across the specialties. The amount of convergent validity was encouraging, but it must be viewed with caution. This validity reflects individual differences over traits and methods. Since the amount of method bias was much greater than that of discriminant validity, convergent validity was probably determined more by the different viewpoints of the rater sources than by traits of performance.

Predictability of the ASVAB

The focus of these analyses is validating the ASVAB for the eight specialties. The analyses were conducted using correlations that were both corrected and not corrected for range

restriction. As noted by advisory groups to the Job Performance Measurement project, corrected correlations provide a common basis for interpretation of ASVAB validities for specialties that use different ASVAB cutoff scores for selection and classification. The Pearson-Lawley procedure was used for multivariate correction on the ten subtests of the ASVAB (Mifflin & Verna, 1977). The 1980 youth population norms were used to perform corrections for each specialty.

Validation was done using the ten ASVAB subtests, four Air Force composites (i.e., MAGE), and AFQT as predictors of the job performance measures. Since technical training school grades have traditionally been used for validating ASVAB predictors, grades were also used as a criterion in the analysis.

The job performance measures included the three WTPT measures (i.e., total, hands-on, and interview) and the job knowledge measure. In addition, five measures were constructed on the basis of the factor analyses. Since the factor analysis for the Jet Engine Mechanic specialty served as a focus for interpretation of the remaining factor analyses, its results were used to define the five criterion composites for each specialty. The measures that characterized each factor were weighted equally to form the composites.

Correlations Among ASVAB Predictors, Job Performance Measures, and Training School Grades

The uncorrected correlations between the ASVAB predictors and job performance measures, factors, and training school grades are reported in Appendix E, while the corrected correlations are reported in Appendix F. As shown in these appendixes, 39% of the correlations between the ASVAB predictors and the job performance measures and factors were statistically significant, while 98% of the correlations between the ASVAB predictors and training school grades were significant.

The pattern of these significant correlations is summarized in Table 6. For each specialty, the job performance measures, factors, and training school grades are indicated that obtained at least one statistically significant relationship with the ASVAB predictors.

Table 6. **Pattern of Significant Correlations Among ASVAB Predictors, Job Performance Measures, and Training School Grades**

	Job Performance		
Specialty	**Measure**	**Factor**	**TGRD**
AIRTRAFF	NONE	SUPER	ALL
AVIONIC	TOT,HOA,INTA	TECH	ALL
ISRADIO	TOT,HOA,INTA	TECH,SUPER,PEER	ALL
JETMECH	TOT,INTA	TECH,SELF	ALL
AEROSPACE	TOT,HOA,INTA,JKT	TECH,SELF,PEER	ALL
AIRCREW	TOT,HOA,INTA,JKT	TECH	ALL
PERSON	TOT,HOA,INTA,JKT	TECH,PEER	ALL
PRECISE	TOT,HOA,INTA,JKT	TECH,SELF,PEER,INP	ALL

Note. Abbreviations are: TGRD, Grade received in technical training; NONE, None of the ASVAB predictors correlated significantly with the job performance measures; ALL, All ASVAB predictors correlated significantly with grades; TOT, Total; HOA, Hands-on; INTA, Interview; and JKT, Job knowledge test.

The correlations between the ASVAB predictors and the job performance measures were modest in magnitude (i.e., .10s to .30s). The Fisher Z transformed averages of the uncorrected correlations are shown in Tables 7 and 8. The total, hands-on, and interview correlations with the ASVAB predictors were similar in magnitude across the specialties. The ASVAB predictors tended to correlate highest with the job knowledge measures. A probable explanation for this tendency is a common requirement of written verbal ability for ASVAB predictors and the job knowledge measures.

Of the job performance factors, the ASVAB predictors correlated highest with the technical proficiency factor. This is not surprising, since this factor is the sum of hands-on and interview test scores, as well as job knowledge scores for four specialties. The ASVAB predictors correlated noticeably lower with the rating source (i.e., supervisory, self, and peer) and interpersonal proficiency factors.

Table 7. **Average Correlations of Job Performance Measures with ASVAB Predictors**

Speciality	Total	Hands-on	Interview	JKT
AIRTRAFF	.138	.125	.124	—
AVIONIC	.316	.267	.292	—
ISRADIO	.286	.242	.331	—
JETMECH	.196	.156	.227	—
AEROSPACE	.233	.261	.173	.391
AIRCREW	.107	.107	.140	.202
PERSON	.219	.208	.163	.240
PRECISE	.326	.317	.269	.364
Average	.230	.212	.216	.302

Table 8. **Average Correlations of Job Performance Factors and Training School Grades With ASVAB Predictors**

	Factors			
Speciality	TECH	SOURCE[a]	INPERS	TGRD
AIRTRAFF	.128	.076	.047	.346
AVIONIC	.298	.140	.150	.476
ISRADIO	.290	.246	.195	.542
JETMECH	.220	.110	.099	.513
AEROSPACE	.310	.078	.028	.324
AIRCREW	.174	.056	.054	.387
PERSON	.260	.125	.128	.378
PRECISE	.356	.231	.115	.408
Average	.262	.136	.103	.393

[a]Average of supervisory, self, and peer factors.

The ASVAB predictors correlated much higher with training school grades (i.e., .30s to .60s) than with the job performance measures and factors. In fact, all of the ASVAB predictors correlated significantly with grades in all but the Information Systems Radio Operator (AFS 492X1) specialty. In that specialty, the correlation with its selection composite was not significant, probably due to range restriction effects.

Unique Predictability of the ASVAB Subtests

An important issue is whether the variance explained by the ASVAB predictors in the job performance measures and training school grades is unique to the type of criterion. If unique variance is accounted for by the ASVAB predictors in each type of criterion, this suggests that the criteria are not interchangeable for selection purposes. This is an important issue, since the ASVAB as a selection tool has historically been validated against the criterion of training school grades.

Multivariate regression analyses were conducted to assess the unique predictability of the ASVAB subtests. The analyses were conducted with uncorrected and corrected correlations. In these analyses, Roy-Bargman step-down tests (Bock, 1975) were used to test for significant unique predictability of the ASVAB subtests for the WTPT measures and training school grades. The results of the step-down analyses for the uncorrected correlations are reported in Appendix G, and those for the corrected correlations are reported in Appendix H.

For each step-down test, squared multiple, partial correlations were calculated. These correlations describe the unique predictability of the ten ASVAB subtests for the WTPT measures and training school grades. The correlations were calculated for corrected and uncorrected ASVAB subtest scores. Further, the hands-on and interview partial correlations were calculated only with training school grades removed. For example, the results immediately after the removal of grades in sets 4 of the step-down analyses were used to calculate the partial correlations for the hands-on measures. Only removing grades emphasized unique predictability for a particular WTPT measure.

Tables 9 and 10 indicate that the subtests uniquely predicted substantial variance in training school grades after removing total or hands-on and interview WTPT scores. That is, 17% to 40% of unique training grade variance was predicted by the uncorrected subtests, and 43% to 79% by the corrected subtests. However, the subtests predicted substantial unique WTPT variance only for the Avionic Communications specialty. For that specialty, 25% to 32% of WTPT score variance was predicted uniquely by the uncorrected subtests, and 32% to 46% by the corrected subtests. For the remaining specialties, ASVAB subtests accounted for much less unique WTPT variance. The uncorrected subtests predicted 5% to 21% of unique WTPT variance, and the corrected subtests predicted 4% to 35%.

IV. RECOMMENDATIONS

Based on the findings, recommendations are made for using job performance measures and training school grades for validating the ASVAB. In the following paragraphs, the structure of the job performance measures is summarized, and then, recommendations are described.

Table 9. **Unique Predictive Effectiveness of 10 ASVAB Subtests for WTPT Measures and Training School Grades (Uncorrected for Restriction)**

	WTPT Measures				
Speciality	TOTWTPT	Hands-on	Interview	TGRD1[a]	TGRD2[a]
AIRTRAFF	.099	.113*	.093	.206**	.202**
AVIONIC	.319**	.250*	.276**	.393**	.401**
ISRADIO	.105	.101	.149	.377**	.365**
JETMECH	.079	.061	.053	.333**	.336**
AEROSPACE	.129**	.143**	.088*	.177**	.170**
AIRCREW	.052	.052	.112*	.198**	.197**
PERSON	.090	.056	.097	.254**	.253**
PRECISE	.206**	.201**	.124	.343**	.334**

[a]Correlations for training school grades obtained from Roy-Bargman analysis sets 1 and 2.
*$p < .05$.
**$p < .01$.

Table 10. **Unique Predictive Effectiveness of 10 ASVAB Subtests for WTPT Measures and Training School Grades (Corrected for Restriction)**

	WTPT Measures				
Speciality	TOTWTPT	Hands-on	Interview	TGRD1[a]	TGRD2[a]
AIRTRAFF	.098	.123*	.086	.575**	.556**
AVIONIC	.435**	.325*	.463**	.772**	.786**
ISRADIO	.216	.209	.278	.658**	.626**
JETMECH	.137	.115	.097	.641**	.639**
AEROSPACE	.187**	.220**	.122*	.453**	.429**
AIRCREW	.039	.039	.098*	.507**	.507**
PERSON	.187	.074	.254	.442**	.448**
PRECISE	.347**	.341**	.212	.620**	.603**

[a]Correlations for training school grades obtained from Roy-Bargman analysis sets 1 and 2.
*$p < .05$.
**$p < .01$.

For all specialties, the factor analyses showed that a structure of four distinct factors was assessed by the job performance measures. Importantly, a technical proficiency factor was found that was defined by the hands-on and interview components of the WTPT and by the job knowledge test. The hands-on component tended to have the greater loadings on this proficiency factor. This is encouraging, since the hands-on component is argued to be the high fidelity measure of technical proficiency (Wigdor & Green, 1986).

The remaining three factors reflected supervisory, self, and peer points of view. These rater source factors were distinct from the technical proficiency factor and correlated both negatively and positively with that factor. Thus, the rater source factors did not consistently reflect a unique perspective of technical proficiency.

Although the job performance measures were designed to measure interpersonal proficiency, a distinct interpersonal factor appeared only for the Jet Engine Mechanic specialty. The remaining specialties had a hybrid interpersonal factor that reflected a single perspective (i.e., supervisory, self, or peer). This suggests that the rating forms were not effective measures of interpersonal proficiency.

Analyses focusing solely on the rating measures revealed a consistent leniency bias. Incumbents rated themselves higher than peers and supervisors, while peers rated the incumbents higher than supervisors.

The rating measures also demonstrated very little discriminant validity, indicating that no matter the level used for describing performance (i.e., task, dimension, global, or Air Force-wide) distinct aspects of performance could not be described with these measures. Although moderate convergent validity was obtained in ordering the incumbents at all levels of performance, this ordering was likely due to the biased perspectives of the rater sources.

With respect to valida...ıg the ASVAB, the technical proficiency factor, as well as its defining measures was correlated with the ASVAB for seven of the eight specialties. Although these validity correlations were modest in magnitude, they suggest that the ASVAB does predict hands-on job performance.

In contrast, the rater source factors showed very small correlations with the ASVAB. The peer factor was predicted by the ASVAB for four specialties, the self factor for three, and the supervisory factor for two specialties. This inconsistent pattern of validity correlations across the specialties indicates that rating measures should not be recommended for validating the ASVAB.

In sum, only three of the job performance measures appear to be acceptable for validating the ASVAB. These measures reflect hands-on performance or procedural knowledge (i.e., interview and job knowledge tests) of that performance, rather than recalled judgments of that performance (i.e., ratings).

Finally, the training outcome of technical school grades was predicted best by the ASVAB measures for all specialties. Even when technical proficiency was partialled from the correlations, the ASVAB still predicted training school grades for all specialties. In contrast, when training school grades were removed from the job performance measures, the ASVAB predicted only three of the eight specialties. Clearly, the ASVAB is most useful for predicting success in training schools.

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APPENDIX A: FACTOR STRUCTURES AND FACTOR INTERCORRELATIONS

Table A-1. **Air Traffic Control Operators (AFS 272X0): Factor Structure of the Job Performance Measures**

Variables	Factors				
	TECH	SUPER	SELF	PEER	PEER-TEC
Hands-on	.804	.194	.228	-.107	-.135
Interview	.995	.144	.229	-.035	-.124
T-self	.278	.242	.845	-.105	-.368
T-supervisor	.263	.872	.358	-.279	-.368
T-peer	.345	.495	.484	-.517	-.815
D-self	.284	.263	.878	-.060	-.361
D-supervisor	.256	.929	.336	-.333	-.332
D-peer	.289	.564	.444	-.510	-.768
A-self-TK	.205	.296	.745	-.158	-.302
A-self-IP	.117	.127	.756	-.132	.051
A-supervisor-TK	.282	.825	.325	-.290	-.380
A-supervisor-IP	.063	.730	.161	-.429	.042
A-peer-TK	.162	.427	.305	-.702	-.492
A-peer-IP	.102	.305	.085	-.853	-.050
G-self-TK	.226	.263	.752	-.153	-.351
G-self-IP	.232	.217	.572	-.164	-.084
G-supervisor-TK	.201	.805	.323	-.400	-.364
G-supervisor-IP	.069	.611	.071	-.326	.070
G-peer-TK	.219	.463	.350	-.691	-.397
G-peer-IP	.003	.325	.083	-.764	-.060

Note. N = 176. Underlined loadings indicate variables that characterize a factor. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent point of view; PEER, overall performance from a peer point of view; and PEER-TEC, proficiency on technical aspects of work from peer point of view. Abbreviations for variables are: T, task-level ratings; D, task-oriented dimensional-level ratings; A, Air Force-wide dimensional-level ratings; G, global-level ratings; TK, technical knowledge and skill; and IP, interpersonal aspects of work.

Table A-2. **Air Traffic Control Operators (AFS 272X0): Correlations Among the Factors of the Job Performance Measures**

Factors	TECH	SUPER	SELF	PEER	PEER-TEC
TECH	1.000				
SUPER	.208	1.000			
SELF	.275	.292	1.000		
PEER	-.092	-.420	-.173	1.000	
PEER-TEC	-.191	-.240	-.282	.148	1.000

Note. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER, overall performance from a peer point of view; and PEER-TEC, proficiency on technical aspects of work from peer point of view.

Table A-3. **Avionic Communications Specialists (AFS 328X0): Factor Structure of the Job Performance Measures**

Variables	Factors				
	TECH	SUPER	SELF	PEER-TEC	PEER-INP
Hands-on	.984	.233	.109	.262	.022
Interview	.636	.188	.141	.257	.110
T-self	.329	.303	.771	.301	.154
T-supervisor	.288	.904	.243	.484	-.077
T-peer	.318	.441	.219	.940	-.274
D-self	.348	.332	.772	.372	.201
D-supervisor	.349	.863	.339	.537	.007
D-peer	.377	.519	.279	.941	-.192
A-self-TK	.415	.398	.789	.324	.127
A-self-IP	-.012	.134	.683	.023	-.116
A-supervisor-TK	.373	.862	.334	.433	.046
A-supervisor-IP	.096	.693	.235	.208	-.433
A-peer-TK	.220	.456	.404	.695	-.369
A-peer-IP	.036	.305	.213	.510	-.844
G-self-TK	.374	.416	.599	.418	.143
G-self-IP	-.100	.098	.525	.103	-.132
G-supervisor-TK	.303	.752	.340	.460	.137
G-supervisor-IP	-.005	.528	.094	.236	-.484
G-peer-TK	.200	.458	.197	.678	-.457
G-peer-IP	-.059	.107	-.030	.335	-.791

Note. N = 86. Underlined loadings indicate variables that characterize a factor. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER-TEC, technical performance from a peer point of view; and PEER-INP, proficiency on interpersonal aspects of work from peer point of view. Abbreviations for variables are: T, task-level ratings; D, task-oriented dimensional-level ratings; A, Air Force-wide dimensional-level ratings; G, global-level ratings; TK, technical knowledge and skill; and IP, interpersonal aspects of work.

Table A-4. **Avionic Communications Specialists (AFS 328X0): Correlations Among the Factors of the Job Performance Measures**

Factors	TECH	SUPER	SELF	PEER-TEC	PEER-INP
TECH	1.000				
SUPER	.268	1.000			
SELF	.169	.299	1.000		
PEER-TEC	.328	.431	.256	1.000	
PEER-INP	.160	-.134	.004	-.174	1.000

Note. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER-TEC, technical performance from a peer point of view; and PEER-INP, proficiency on interpersonal aspects of work from peer point of view.

Table A-5. **Information Systems Radio Operators (AFS 492X1): Factor Structure of the Job Performance Measures**

Variables	Factors				
	TECH	SUP-TEC	SELF	PEER	SUP-INP
Hands-on	.807	.279	.168	.288	-.074
Interview	.992	.343	.062	.297	-.027
T-self	.316	.456	.765	.278	-.335
T-supervisor	.388	.862	.337	.379	.038
T-peer	.323	.547	.362	.792	-.160
D-self	.314	.451	.825	.244	-.358
D-supervisor	.353	.872	.295	.424	.087
D-peer	.464	.600	.417	.816	-.210
A-self-TK	.275	.359	.722	.378	-.253
A-self-IP	.058	.154	.740	.136	.207
A-supervisor-TK	.376	.874	.273	.390	.068
A-supervisor-IP	.072	.483	.222	.292	.706
A-peer-TK	.419	.419	.230	.754	-.054
A-peer-IP	.192	.135	.114	.686	.295
G-self-TK	.379	.495	.626	.365	-.318
G-self-IP	-.045	.037	.551	.208	.171
G-supervisor-TK	.372	.874	.233	.354	.025
G-supervisor-IP	.174	.345	.077	.364	.539
G-peer-TK	.374	.523	.257	.708	-.097
G-peer-IP	.137	.113	.189	.562	.234

Note. N = 139. Underlined loadings indicate variables that characterize a factor. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUP-TEC, technical proficiency from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER, overall performance from a peer point of view; and SUP-INP, proficiency on interpersonal aspects of work from supervisory point of view. Abbreviations for variables are: T, task-level ratings; D, task-oriented dimensional-level ratings; A, Air Force-wide dimensional-level ratings; G, global level ratings; TK, technical knowledge and skill; and IP, interpersonal aspects of work.

Table A-6. **Information Systems Radio Operators (AFS 492X1): Correlations Among the Factors of the Job Performance Measures**

Factors	TECH	SUP-TEC	SELF	PEER	SUP-INP
TECH	1.000				
SUP-TEC	.383	1.000			
SELF	.151	.294	1.000		
PEER	.331	.381	.281	1.000	
SUP-INP	-.115	-.027	-.049	.102	1.000

Note. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUP-TEC, technical proficiency from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER, overall performance from a peer point of view; and SUP-INP, proficiency on interpersonal aspects of work from supervisory point of view.

Table A-7. **Jet Engine Mechanics (AFS 426X2): Factor Structure of the Job Performance Measures**

Variables	Factors				
	TECH	SUPER	SELF	PEER	INPERS
Hands-on	.556	.308	.173	.312	-.077
Interview	.986	.180	.146	.192	-.092
T-self	.275	.305	.860	.288	-.095
T-supervisor	.334	.836	.395	.368	-.096
T-peer	.346	.396	.357	.828	-.033
D-self	.243	.340	.873	.320	-.100
D-supervisor	.301	.888	.452	.482	-.102
D-peer	.397	.449	.400	.884	-.095
A-self-TK	.252	.406	.803	.368	-.029
A-self-IP	-.134	.278	.593	.169	.526
A-supervisor-TK	.279	.834	.400	.442	.039
A-supervisor-IP	.072	.815	.152	.428	.431
A-peer-TK	.261	.476	.284	.783	-.028
A-peer-IP	.078	.306	.097	.648	.495
G-self-TK	.169	.292	.751	.242	-.063
G-self-IP	-.023	.236	.488	.198	.370
G-supervisor-TK	.290	.810	.328	.482	-.046
G-supervisor-IP	.082	.675	.069	.373	.443
G-peer-TK	.278	.501	.343	.724	-.062
G-peer-IP	.015	.308	.041	.576	.348

Note. N = 216. Underlined loadings indicate variables that characterize a factor. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER, overall performance from a peer point of view; and INPERS, overall proficiency on interpersonal aspects of work from supervisory, incumbent, and peer points of view. Abbreviations for variables are: T, task-level ratings; D, task-oriented dimensional-level ratings; A, Air Force-wide dimensional-level ratings; G, global level ratings; TK, technical knowledge and skill; and IP, interpersonal aspects of work.

Table A-8. **Jet Engine Mechanics (AFS 426X2): Correlations Among the Factors of the Job Performance Measures**

Variables	TECH	SUPER	SELF	PEER	INPERS
TECH	1.000				
SUPER	.242	1.000			
SELF	.175	.329	1.000		
PEER	.266	.479	.270	1.000	
INPERS	-.211	.118	-.014	.115	1.000

Note. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisoryy point of view; SELF, overall performance from incumbent's point of view; PEER, overall performance from a peer point of view; and INPERS, overall proficiency on interpersonal aspects of work from supervisory, incumbent, and peer points of view.

Table A-9. **Aerospace Ground Equipment Mechanics (AFS 423X5): Factor Structure of the Job Performance Measures**

Variables	Factors				
	TECH	SUPER	SELF	PEER	PEER-TEC
Hands-on	-.820	.274	.284	.168	.234
Interview	-.836	.258	.338	.181	.254
JKT	-.510	.181	.216	.102	.303
T-self	-.368	.242	.808	.100	.318
T-supervisor	-.337	.893	.366	.309	.253
T-peer	-.420	.490	.422	.556	.806
D-self	-.397	.344	.858	.155	.362
D-supervisor	-.368	.945	.370	.329	.292
D-peer	-.428	.509	.463	.589	.827
A-self-TK	-.371	.371	.693	.175	.308
A-self-IP	-.104	.402	.654	.414	-.015
A-supervisor-TK	-.305	.872	.374	.374	.263
A-supervisor-IP	-.145	.808	.337	.481	.022
A-peer-TK	-.398	.438	.390	.612	.540
A-peer-IP	-.136	.400	.215	.878	.206
G-self-TK	-.381	.342	.687	.245	.184
G-self-IP	-.122	.258	.603	.224	-.021
G-supervisor-TK	-.281	.828	.345	.364	.247
G-supervisor-IP	-.079	.784	.348	.445	.033
G-peer-TK	-.403	.413	.294	.637	.523
G-peer-IP	-.229	.381	.271	.758	.240

Note. N = 247. Underlined loadings indicate variables that characterize a factor. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent point of view; PEER, overall performance from a peer point of view; and PEER-TEC, proficiency on technical aspects of work from peer point of view. Abbreviations for variables are: JKT, job knowledge test; T, task-level ratings; D, task-oriented dimensional-level ratings; A, Air Force-wide dimensional-level ratings; G, global-level ratings; TK, technical knowledge and skill; and IP, interpersonal aspects of work.

Table A-10. **Aerospace Ground Equipment Mechanics (AFS 423X5): Correlations Among the Factors the Job Performance Measures**

Variables	TECH	SUPER	SELF	PEER	PEER-TEC
TECH	1.000				
SUPER	-.284	1.000			
SELF	-.341	.405	1.000		
PEER	-.158	.442	.277	1.000	
PEER-TE	-.389	.212	.208	.209	1.000

Note. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER, overall performance from a peer point of view; and PEER-TEC, proficiency on technical aspects of work from peer point of view.

Table A-11. **Aircrew Life Support Specialists (AFS 122X0): Factor Structure of the Job Performance Measures**

Variables	Factors				
	TECH	SUPER	SELF	PEER	PEER-TEC
Hands-on	.619	.113	.116	-.053	-.184
Interview	.929	.061	.220	-.065	-.188
JKT	.723	.148	.110	.025	-.400
T-self	.275	.159	.821	-.020	-.178
T-supervisor	.163	.838	.285	-.149	-.226
T-peer	.344	.394	.306	-.449	-.861
D-self	.250	.204	.756	-.039	-.276
D-supervisor	.188	.849	.381	-.240	-.412
D-peer	.311	.414	.374	-.536	-.824
A-self-TK	.094	.298	.581	-.260	-.140
A-self-IP	-.075	.342	.541	-.341	-.073
A-supervisor-TK	.081	.810	.285	-.274	-.252
A-supervisor-IP	.024	.795	.240	-.414	-.097
A-peer-TK	.076	.302	.251	-.794	-.277
A-peer-IP	-.003	.360	.235	-.893	-.183
G-self-TK	.086	.265	.572	-.277	-.109
G-self-IP	.014	.163	.391	-.265	.046
G-supervisor-TK	.129	.824	.284	-.258	-.212
G-supervisor-IP	.022	.751	.223	-.294	-.053
G-peer-TK	.147	.288	.290	-.744	-.364
G-peer-IP	.010	.288	.263	-.819	-.099

Note. N = 179. Underlined loadings indicate variables that characterize a factor. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent point of view; PEER, overall performance from a peer point of view; and PEER-TEC, proficiency on technical aspects of work from peer point of view. Abbreviations for variables are: JKT, job knowledge test; T, task-level ratings; D, task-oriented dimensional-level ratings; A, Air Force-wide dimensional-level ratings; G, global-level ratings; TK, technical knowledge and skill; and IP, interpersonal aspects of work.

Table A-12. **Aircrew Life Support Specialists (AFS 122X0): Correlations Among the Factors of the Job Performance Measures**

Variables	TECH	SUPER	SELF	PEER	PEER-TEC
TECH	1.000				
SUPER	.099	1.000			
SELF	.166	.330	1.000		
PEER	-.001	-.337	-.277	1.000	
PEER-TEC	-.315	-.227	-.168	.167	1.000

Note. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER, overall performance from a peer point of view; and PEER-TEC, proficiency on technical aspects of work from peer point of view.

Table A-13. **Personnel Specialists (AFS 7234X0): Factor Structure of the Job Performance Measures**

Variables	Factors				
	TECH	SUPER	SELF	PEER-TEC	PEER-INP
Hands-on	.998	.114	.167	-.291	-.117
Interview	.283	.247	.133	-.181	-.231
JKT	.512	.057	.042	-.096	-.014
T-self	.284	.036	.796	-.275	-.178
T-supervisor	.202	.806	.125	-.446	-.111
T-peer	.388	.317	.302	-.657	.028
D-self	.226	.047	.841	-.337	-.279
D-supervisor	.154	.910	.044	-.431	-.089
D-peer	.216	.460	.298	-.803	.065
A-self-TK	.141	.089	.662	-.443	-.129
A-self-IP	-.030	.109	.793	-.126	.216
A-supervisor-TK	.143	.824	.070	-.466	.084
A-supervisor-IP	.110	.792	.055	-.144	.330
A-peer-TK	.181	.331	.234	-.793	.229
A-peer-IP	.102	.355	.130	-.466	.693
G-self-TK	.225	.013	.562	-.322	-.112
G-self-IP	-.006	.107	.506	-.046	.240
G-supervisor-TK	.124	.788	.150	-.324	.119
G-supervisor-IP	.008	.674	.013	-.089	.360
G-peer-TK	.234	.298	.264	-.723	.141
G-peer-IP	.035	.261	.110	-.353	.632

Note. N = 185. Underlined loadings indicate variables that characterize a factor. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent point of view; PEER-TEC, proficiency on technical aspects of work from peer point of view; and PEER-INP, proficiency on interpersonal aspects of work from peer point of view. Abbreviations for variables are: JKT, job knowledge test; T, task-level ratings; D, task-oriented dimensional-level ratings; A, Air Force-wide dimensional-level ratings; G, global-level ratings; TK, technical knowledge and skill; and IP, interpersonal aspects of work.

Table A-14. **Personnel Specialists (AFS 7234X0): Correlations Among the Factors of the Job Performance Measures**

Variables	TECH	SUPER	SELF	PEER-TEC	PEER-INP
TECH	1.000				
SUPER	.147	1.000			
SELF	.155	.090	1.000		
PEER-TEC	-.273	-.338	-.285	1.000	
PEER-INP	-.130	.144	-.003	-.027	1.000

Note. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER-TEC, technical performance from a peer point of view; and PEER-INP, proficiency on interpersonal aspects of work from peer point of view.

Table A-15. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Factor Structure of the Job Performance Measures**

Variables	Factors				
	TECH	SUPER	SELF	PEER-TEC	PEER-INP
Hands-on	.712	.248	.107	.287	-.202
Interview	.673	.193	-.060	.254	.027
JKT	.739	.325	.079	.340	-.201
T-self	.345	.242	.705	.312	-.451
T-supervisor	.342	.784	.309	.346	-.097
T-peer	.464	.290	.205	.846	-.040
D-self	.344	.279	.704	.336	-.580
D-supervisor	.379	.872	.301	.386	-.133
D-peer	.450	.360	.194	.804	-.138
A-self-TK	.275	.315	.452	.292	-.679
A-self-IP	-.032	.409	.747	.152	-.008
A-supervisor-TK	.451	.754	.285	.342	-.128
A-supervisor-IP	-.006	.708	.407	.228	.425
A-peer-TK	.348	.255	.202	.881	-.220
A-peer-IP	.133	.343	.170	.637	.397
G-self-TK	.259	.435	.513	.314	-.585
G-self-IP	-.095	.186	.574	.094	.004
G-supervisor-TK	.254	.812	.271	.286	-.056
G-supervisor-IP-	.066	.580	.429	.159	.328
G-peer-TK	.301	.314	.202	.826	-.283
G-peer-IP	.143	.229	.192	.608	.320

Note. N = 135. Underlined loadings indicate variables that characterize a factor. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent point of view; PEER, overall performance from a peer point of view; and SELF-TEC, proficiency on technical aspects of work from incumbent point of view as contrasted from supervisory and peer points of view. Abbreviations for variables are: JKT, job knowledge test; T, task level ratings; D, task-oriented dimensional-level ratings; A, Air Force-wide dimensional-level ratings; G, global-level ratings; TK, technical knowledge and skill; and IP, interpersonal aspects of work.

Table A-16. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Correlations Among the Factors of the Job Performance Measures**

Variables	TECH	SUPER	SELF	PEER-TEC	PEER-INP
TECH	1.000				
SUPER	.263	1.000			
SELF	.026	.385	1.000		
PEER	.361	.335	.237	1.000	
SELF-TEC	-.232	.022	-.127	-.045	1.000

Note. Abbreviations for factors are: TECH, proficiency of the technical aspects of work; SUPER, overall performance from supervisory point of view; SELF, overall performance from incumbent's point of view; PEER, overall performance from a peer point of view; and SELF-TEC, proficiency on technical aspects of work from incumbent point of view as contrasted from supervisory and peer points of view.

APPENDIX B: SQUARED MULTIPLE CORRELATIONS FOR WTPT MEASURES USING COMPOSITE RATINGS

Table B-1. **Air Traffic Control Operators (AFS 272X0): Squared Multiple Correlation Coefficients for Walk-Through Performance Test Measures Using the Composite Ratings of Self, Peer, and Supervisor Sources as Predictors Obtained with Task, Dimension, Air Force-Wide Technical Knowledge, and Global Technical Proficiency Rating Forms**

WTPT Measures	Rating Form			
	Task	Dimension	Air Force	Global
TOTWTPT	.086**	.088**	.071**	.056**
Hands-on	.080**	.088**	.070**	.065**
Interview	.083**	.070**	.057*	.046*

Note. N ranged from 183 to 184. Abbreviation: TOTWTPT, Total score obtained with Walk-Through Performance Testing.
*$p < .05$.
**$p < .01$.

Table B-2. **Avionic Communications Specialists (AFS 328X0): Squared Multiple Correlation Coefficients for Walk-Through Performance Test Measures Using the Composite Ratings of Self, Peer, and Supervisor Sources as Predictors Obtained with Task, Dimension, Air Force-Wide Technical Knowledge, and Global Technical Proficiency Rating Forms**

WTPT Measures	Rating Form			
	Task	Dimension	Air Force	Global
TOTWTPT	.149**	.171**	.162**	.094*
Hands-on	.123**	.135**	.155**	.110*
Interview	.109*	.122**	.107*	.053

Note. N ranged from 86 to 90. Abbreviation: TOTWTPT, Total score obtained with Walk-Through Performance Testing.
*$p < .05$.
**$p < .01$.

Table B-3. **Information Systems Radio Operators (AFS 492X1): Squared Multiple Correlation Coefficients for Walk-Through Performance Test Measures Using the Composite Ratings of Self, Peer, and Supervisor Sources as Predictors Obtained with Task, Dimension, Air Force-Wide Technical Knowledge, and Global Technical Proficiency Rating Forms**

WTPT Measures	Rating Form			
	Task	Dimension	Air Force	Global
TOTWTPT	.080*	.146*	.132*	.130*
Hands-on	.076*	.136*	.122*	.132*
Interview	.109*	.160*	.194*	.159*

Note. N ranged from 142 to 148. Abbreviation: TOTWTPT, Total score obtained with Walk-Through Performance Testing.
*$p < .01$.

Table B-4. **Jet Engine Mechanics (AFS 426X2): Squared Multiple Correlation Coefficients for Walk-Through Performance Test Measures Using the Composite Ratings of Self, Peer, and Supervisor Sources as Predictors Obtained with Task, Dimension, Air Force-Wide Technical Knowledge, and Global Technical Proficiency Rating Forms**

WTPT Measures	Rating Form			
	Task	Dimension	Air Force	Global
TOTWTPT	.132*	.185*	.137*	.141*
Hands-on	.104*	.177*	.132*	.152*
Interview	.106*	.097*	.069*	.059*

Note. N ranged from 217 to 222. Abbreviation: TOTWTPT, Total score obtained with Walk-Through Performance Testing.
*$p < .01$.

Table B-5. **Aerospace Ground Equipment Mechanics (AFS 423X5): Squared Multiple Correlation Coefficients for Walk-Through Performance Test Measures Using the Composite Ratings of Self, Peer, and Supervisor Sources as Predictors Obtained with Task, Dimension, Air Force-Wide Technical Knowledge, and Global Technical Proficiency Rating Forms**

WTPT Measures	Rating Form			
	Task	Dimension	Air Force	Global
TOTWTPT	.186*	.184*	.163*	.194*
Hands-on	.159*	.162*	.137*	.165*
Interview	.178*	.177*	.168*	.189*

Note. N = 257. Abbreviation: TOTWTPT, Total score obtained with Walk-Through Performance Testing.
*$p < .01$.

Table B-6. **Aircrew Life Support Specialists (AFS 122X0): Squared Multiple Correlation Coefficients for Walk-Through Performance Test Measures Using the Composite Ratings of Self, Peer, and Supervisor Sources as Predictors Obtained with Task, Dimension, Air Force-Wide Technical Knowledge, and Global Technical Proficiency Rating Forms**

WTPT Measures	Rating Form			
	Task	Dimension	Air Force	Global
TOTWTPT	.070**	.053*	.018	.047*
Hands-on	.070**	.053*	.018	.047*
Interview	.126**	.100**	.021	.036

Note. N ranged from 184 to 185. Abbreviation: TOTWTPT, Total score obtained with Walk-Through Performance Testing.
*$p < .05$.
**$p < .01$.

Table B-7. Personnel Specialists (AFS 732X0): Squared Multiple Correlation Coefficients for Walk-Through Performance Test Measures Using the Composite Ratings of Self, Peer, and Supervisor Sources as Predictors Obtained with Task, Dimension, Air Force-Wide Technical Knowledge, and Global Technical Proficiency Rating Forms

WTPT Measures	Rating Form			
	Task	Dimension	Air Force	Global
TOTWTPT	.184*	.156*	.091*	.160*
Hands-on	.184*	.090*	.059*	.111*
Interview	.072*	.114*	.068*	.104*

Note. N = 190. Abbreviation: TOTWTPT, Total score obtained with Walk-Through Performance Testing.
*p < .01.

Table B-8. Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Squared Multiple Correlation Coefficients for Walk-Through Performance Test Measures Using the Composite Ratings of Self, Peer, and Supervisor Sources as Predictors Obtained with Task, Dimension, Air Force-Wide Technical Knowledge, and Global Technical Proficiency Rating Forms

WTPT Measures	Rating Form			
	Task	Dimension	Air Force	Global
TOTWTPT	.195**	.182**	.155**	.100**
Hands-on	.197**	.178**	.155**	.099**
Interview	.071*	.110**	.140**	.051

Note. N ranged from 136 to 138. Abbreviation: TOTWTPT, Total score obtained with Walk-Through Performance Testing.
*p < .05.
**p < .01.

APPENDIX C: MEAN COMPARISONS AMONG RATER SOURCES USING FISHER'S POST HOC LSD TEST

Table C-1. **Air Traffic Control Operators (AFS 272X0): Number of Significant Mean Comparisons Among Rater Sources Using Fisher's Post Hoc LSD Test**

	Mean Comparison[a]					
Rating Form	SE> PE	SE> SU	PE> SU	PE> SE	SU> SE	SU> PE
Task	1(1)	6(2)	-	-	-	-
Dimension	2(1)	4(4)	4(3)	-	-	-
Air Force	6(6)	8(8)		-	-	-
Global	1(1)	2(2)	1(1)	-	-	-

Note. Number of tasks = 15; Task dimensions = 4; Air Force wide dimensions = 8; Global dimensions = 2. Rater source abbreviations: SE, Self; PE, Peer; SU, Supervisor.

[a]Table entries indicate the number of comparisons significant at $p < .017$ and $p < .003$ (in parentheses).

Table C-2. **Avionic Communications Specialists (AFS 328X0): Number of Significant Mean Comparisons Among Rater Sources Using Fisher's Post Hoc LSD Tests**

	Mean Comparison[a]					
Rating Form	SE> PE	SE> SU	PE> SU	PE> SE	SU> SE	SU> PE
Task	2(1)	3(1)	1(1)	-	-	-
Dimension	-	-	-	1(0)	-	-
Air Force	2(1)	3(1)	-	-	-	-
Global	-	1(0)	-	-	-	-

Note. Number of tasks = 25; Task dimensions = 5; Air Force wide dimensions = 8; Global dimensions = 2. Rater source abbreviations: SE, Self; PE, Peer; SU, Supervisor.

[a]Table entries indicate the number of comparisons significant at $p < .017$ and $p < .003$ (in parentheses).

Table C-3. **Information Systems Radio Operators (AFS 492X1): Number of Significant Mean Comparisons Among Rater Sources Using Fisher's Post Hoc LSD Tests**

	Mean Comparison[a]					
Rating Form	SE> PE	SE> SU	PE> SU	PE> SE	SU> SE	SU> PE
Task	-	-	-	-	2(1)	-
Dimension	-	-	-	-	-	-
Air Force	2(1)	2(1)	-	-	-	-
Global	-	1(0)	-	-	-	-

Note. Number of tasks = 14; Task dimensions = 5; Air Force wide dimensions = 8; Global dimensions = 2. Rater source abbreviations: SE, Self; PE, Peer; SU, Supervisor.

[a]Table entries indicate the number of comparisons significant at $p < .017$ and $p < .003$ (in parentheses).

Table C-4. **Jet Engine Mechanics (AFS 426X2): Number of Significant Mean Comparisons Among Rater Sources Using Fisher's Post Hoc LSD Tests**

	Mean Comparison[a]					
Rating Form	SE> PE	SE> SU	PE> SU	PE> SE	SU> SE	SU> PE
Task	3(2)	8(7)	-	-	-	-
Dimension	2(1)	4(3)	-	-	-	-
Air Force	6(5)	5(3)	-	-	-	-
Global	2(2)	2(2)	-	-	-	-

Note. Number of tasks = 12; Task dimensions = 4; Air Force wide dimensions = 8; Global dimensions = 2. Rater source abbreviations: SE, Self; PE, Peer; SU, Supervisor.

[a]Table entries indicate the number of comparisons significant at $p < .017$ and $p < .003$ (in parentheses).

Table C-5. **Aerospace Ground Equipment Mechanics (AFS 423X5): Number of Significant Mean Comparisons Among Rater Sources Using Fisher's Post Hoc LSD Tests**

	Mean Comparison[a]					
Rating Form	SE> PE	SE> SU	PE> SU	PE> SE	SU> SE	SU> PE
Task	20(12)	24(17)	9(5)	-	-	1(0)
Dimension	2(2)	8(7)	7(5)	-	-	-
Air Force	5(3)	7(6)	2(1)	-	-	-
Global	1(1)	2(2)	1(0)	-	-	-

Note. Number of tasks = 39; Task dimensions = 9; Air Force wide dimensions = 8; Global dimensions = 2. Rater source abbreviations: SE, Self; PE, Peer; SU, Supervisor.

[a]Table entries indicate the number of comparisons significant at $p < .017$ and $p < .003$ (in parentheses).

Table C-6. **Aircrew Life Support Specialists (AFS 122X0): Number of Significant Mean Comparisons Among Rater Sources Using Fisher's Post Hoc LSD Tests**

	Mean Comparison[a]					
Rating Form	SE> PE	SE> SU	PE> SU	PE> SE	SU> SE	SU> PE
Task	8(4)	9(8)	-	-	-	-
Dimension	2(2)	3(2)	-	-	-	-
Air Force	4(4)	4(4)	-	-	-	-
Global	2(2)	2(2)	-	-	-	-

Note. Number of tasks = 16; Task dimensions = 6; Air Force wide dimensions = 8; Global dimensions = 2. Rater source abbreviations: SE, Self; PE, Peer; SU, Supervisor.

[a]Table entries indicate the number of comparisons significant at $p < .017$ and $p < .003$ (in parentheses).

Table C-7. **Personnel Specialists (AFS 732X0): Number of Significant Mean Comparisons Among Rater Sources Using Fisher's Post Hoc LSD Tests**

	Mean Comparison[a]					
Rating Form	**SE> PE**	**SE> SU**	**PE> SU**	**PE> SE**	**SU> SE**	**SU> PE**
Task	7(5)	6(6)	1(0)	-	-	-
Dimension	5(4)	6(6)	2(2)	-	-	-
Air Force	8(7)	8(6)	2(0)	-	-	-
Global	2(2)	2(2)	1(0)	-	-	-

Note. Number of tasks = 8; Task dimensions = 6; Air Force wide dimensions = 8; Global dimensions = 2. Rater source abbreviations: SE, Self; PE, Peer; SU, Supervisor.

[a]Table entries indicate the number of comparisons significant at $p < .017$ and $p < .003$ (in parentheses).

Table C-8. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Number of Significant Mean Comparisons Among Rater Sources Using Fisher's Post Hoc LSD Tests**

	Mean Comparison[a]					
Rating Form	**SE> PE**	**SE> SU**	**PE> SU**	**PE> SE**	**SU> SE**	**SU> PE**
Task	8(1)	11(7)	2(2)	-	-	-
Dimension	1(0)	4(1)	-	-	-	-
Air Force	1(1)	4(3)	1(0)	-	-	-
Global	-	1(1)	-	-	-	-

Note. Number of tasks = 28; Task dimensions = 5; Air Force wide dimensions = 8; Global dimensions = 2. Rater source abbreviations: SE, Self; PE, Peer; SU, Supervisor.

[a]Table entries indicate the number of comparisons significant at $p < .017$ and $p < .003$ (in parentheses).

APPENDIX D: MULTITRAIT-MULTIMETHOD ANALYSES OF RATING FORMS

Table D-1. **Air Traffic Control Operators (AFS 272X0): Multitrait-Multimethod Analysis of Variance of Task Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	180	13.584	32.749*	.293	.259
I x S	360	5.772	13.914*	.357	.316
I x T	2520	.608	1.465*	.064	.057
Error	5040	.415		.415	

Note. Number of job incumbents = 181. Number of rater sources = 3. Number of traits = 15. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-2. **Avionic Communications Specialists (AFS 328X0): Multitrait-Multimethod Analysis of Variance of Task Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	77	20.288	45.527*	.265	.236
I x S	154	8.099	18.175*	.306	.274
I x T	1848	.754	1.692*	.103	.092
Error	3696	.446		.446	

Note. Number of job incumbents = 78. Number of rater sources = 3. Number of traits = 25. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-3. **Information Systems Radio Operators (AFS 492X1): Multitrait-Multimethod Analysis of Variance of Task Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	140	12.697	27.106*	.291	.261
I x S	280	4.965	10.599*	.321	.288
I x T	1820	.576	1.231*	.036	.032
Error	3640	.468		.468	

Note. Number of job incumbents = 141. Number of rater sources = 3. Number of traits = 14. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-4. **Jet Engine Mechanics (AFS 426X2): Multitrait-Multimethod Analysis of Variance of Task Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	163	8.342	17.679*	.219	.195
I x S	326	4.239	8.982*	.314	.280
I x T	1793	.820	1.738*	.116	.104
Error	3586	.472		.472	

Note. Number of job incumbents = 164. Number of rater sources = 3. Number of traits = 12. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-5. **Aerospace Ground Equipment Mechanics (AFS 423X5): Multitrait-Multimethod Analysis of Variance of Task Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	241	28.288	59.372*	.238	.214
I x S	482	12.826	26.920*	.317	.285
I x T	9138	.719	1.510*	.081	.073
Error	18316	.476		.476	

Note. Number of job incumbents = 242. Number of rater sources = 3. Number of traits = 39. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-6. **Aircrew Life Support Specialists (AFS 122X0): Multitrait-Multimethod Analysis of Variance of Task Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	178	11.070	24.659*	.221	.194
I x S	356	6.529	14.543*	.380	.334
I x T	2670	.712	1.585*	.088	.077
Error	5340	.449		.449	

Note. Number of job incumbents = 179. Number of rater sources = 3. Number of traits = 16. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-7. **Personnel Specialists (AFS 732X0): Multitrait-Multimethod Analysis of Variance of Task Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	186	4.572	7.930*	.166	.151
I x S	372	2.644	4.586*	.258	.234
I x T	1302	.885	1.535*	.104	.093
Error	2604	.577		.577	

Note. Number of job incumbents = 187. Number of rater sources = 3. Number of traits = 8. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-8. ***Precision Measurement* Equipment Laboratory Specialists (AFS 324X0): Multitrait-Multimethod Analysis of Variance of Task Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	133	20.159	39.091*	.234	.212
I x S	266	8.358	16.208*	.280	.254
I x T	3591	.737	1.430*	.074	.067
Error	7182	.516		.516	

Note. Number of job incumbents = 134. Number of rater sources = 3. Number of traits = 28. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-9. ***Air Traffic Control* Operators (AFS 272X0): Multitrait-Multimethod Analysis of Variance of Dimension Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	182	4.390	10.129*	.330	.295
I x S	364	1.549	3.574*	.279	.250
I x T	546	.659	1.520*	.075	.067
Error	1092	.433		.433	

Note. Number of job incumbents = 183. Number of rater sources = 3. Number of traits = 4. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-10. **Avionic Communications Specialists (AFS 328X0): Multitrait-Multimethod Analysis of Variance of Dimension Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	83	5.229	10.117*	.314	.286
I x S	166	1.784	3.452*	.254	.230
I x T	332	.562	1.088	.015	.014
Error	664	.517		.517	

Note. Number of job incumbents = 84. Number of rater sources = 3. Number of traits = 5. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-11. **Information Systems Radio Operators (AFS 492X1): Multitrait-Multimethod Analysis of Variance of Dimension Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	140	5.844	13.158*	.360	.326
I x S	280	1.868	4.207*	.285	.258
I x T	560	.494	1.112	.016	.015
Error	1120	.444		.444	

Note. Number of job incumbents = 141. Number of rater sources = 3. Number of traits = 5. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-12. **Jet Engine Mechanics (AFS 426X2): Multitrait-Multimethod Analysis of Variance of Dimension Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	214	5.038	12.661*	.387	.350
I x S	428	1.414	3.553*	.254	.230
I x T	642	.601	1.511*	.068	.061
Error	1284	.398		.398	

Note. Number of job incumbents = 215. Number of rater sources = 3. Number of traits = 4. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-13. **Aerospace Ground Equipment Mechanics (AFS 423X5): Multitrait-Multimethod Analysis of Variance of Dimension Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	254	8.395	18.219*	.294	.266
I x S	508	2.888	6.267*	.270	.245
I x T	2032	.696	1.509*	.078	.071
Error	4064	.461		.461	

Note. Number of job incumbents = 255. Number of rater sources = 3. Number of traits = 9. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-14. **Aircrew Life Support Specialists (AFS 122X0): Multitrait-Multimethod Analysis of Variance of Dimension Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	179	5.188	11.033*	.262	.234
I x S	358	2.295	4.882*	.304	.271
I x T	895	.724	1.540*	.085	.075
Error	1790	.470		.470	

Note. Number of job incumbents = 180. Number of rater sources = 3. Number of traits = 6. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-15. **Personnel Specialists (AFS 732X0): Multitrait-Multimethod Analysis of Variance of Dimension Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	187	4.480	7.965*	.218	.197
I x S	374	2.198	3.907*	.272	.247
I x T	935	.719	1.279*	.052	.047
Error	1870	.562		.562	

Note. Number of job incumbents = 188. Number of rater sources = 3. Number of traits = 6. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-16. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Multitrait-Multimethod Analysis of Variance of Dimension Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	133	4.764	9.441*	.284	.256
I x S	266	1.937	3.839*	.286	.258
I x T	532	.609	1.208	.035	.032
Error	1064	.505		.505	

Note. Number of job incumbents = 134. Number of rater sources = 3. Number of traits = 5. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-17. **Air Traffic Control Operators (AFS 272X0): Multitrait-Multimethod Analysis of Variance of Air Force-Wide Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	175	5.738	11.768*	.219	.194
I x S	350	3.078	6.312*	.324	.288
I x T	1225	.774	1.588*	.096	.085
Error	2450	.488		.488	

Note. Number of job incumbents = 176. Number of rater sources = 3. Number of traits = 8. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-18. **Avionic Communications Specialists (AFS 328X0): Multitrait-Multimethod Analysis of Variance of Air Force-Wide Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	85	6.192	13.596*	.239	.213
I x S	170	2.665	5.851*	.276	.246
I x T	595	.912	2.002*	.152	.136
Error	1190	.456		.456	

Note. Number of job incumbents = 86. Number of rater sources = 3. Number of traits = 8. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-19. **Information Systems Radio Operators (AFS 492X1): Multitrait-Multimethod Analysis of Variance of Air Force-Wide Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	140	5.906	12.539*	.226	.200
I x S	280	3.121	6.628*	.331	.293
I x T	980	.776	1.647*	.102	.090
Error	1960	.471		.471	

Note. Number of job incumbents = 141. Number of rater sources = 3. Number of traits = 8. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-20. **Jet Engine Mechanics (AFS 426X2): Multitrait-Multimethod Analysis of Variance of Air Force-Wide Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	215	7.510	17.784*	.295	.265
I x S	430	2.740	6.488*	.290	.260
I x T	1505	.744	1.763*	.107	.096
Error	3010	.422		.422	

Note. Number of job incumbents = 216. Number of rater sources = 3. Number of traits = 8. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-21. **Aerospace Ground Equipment Mechanics (AFS 423X5): Multitrait-Multimethod Analysis of Variance of Air Force-Wide Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	246	7.619	16.365*	.298	.272
I x S	492	2.396	5.146*	.241	.220
I x T	1722	.738	1.586*	.091	.083
Error	3444	.466		.466	

Note. Number of job incumbents = 247. Number of rater sources = 3. Number of traits = 8. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-22. **Aircrew Life Support Specialists (AFS 122X0): Multitrait-Multimethod Analysis of Variance of Air Force-Wide Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	178	7.513	17.307*	.295	.265
I x S	356	2.714	6.253*	.285	.256
I x T	1246	.731	1.684*	.099	.089
Error	2492	.434		.434	

Note. Number of job incumbents = 179. Number of rater sources = 3. Number of traits = 8. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-23. **Personnel Specialists (AFS 732X0): Multitrait-Multimethod Analysis of Variance of Air Force-Wide Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	185	5.963	12.750*	.229	.204
I x S	370	3.008	6.432*	.318	.282
I x T	1295	.800	1.711*	.111	.099
Error	2590	.468		.468	

Note. Number of job incumbents = 186. Number of rater sources = 3. Number of traits = 8. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-24. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Multitrait-Multimethod Analysis of Variance of Air Force-Wide Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	134	6.454	13.678*	.249	.225
I x S	268	2.533	5.368*	.258	.232
I x T	938	.864	1.832*	.131	.118
Error	1876	.472		.472	

Note. Number of job incumbents = 135. Number of rater sources = 3. Number of traits = 8. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*$p < .01$.

Table D-25. **Air Traffic Control Operators (AFS 272X0): Multitrait-Multimethod Analysis of Variance of Global Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	183	2.350	5.439*	.320	.276
I x S	366	1.038	2.401*	.303	.261
I x T	183	.743	1.720*	.104	.090
Error	366	.432		.432	

Note. Number of job incumbents = 184. Number of rater sources = 3. Number of traits = 2. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-26. **Avionic Communications Specialists (AFS 328X0): Multitrait-Multimethod Analysis of Variance of Global Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	85	2.035	3.708*	.248	.212
I x S	170	.905	1.648*	.178	.152
I x T	85	1.128	2.056*	.193	.165
Error	170	.549		.549	

Note. Number of job incumbents = 86. Number of rater sources = 3. Number of traits = 2. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-27. **Information Systems Radio Operators (AFS 492X1): Multitrait-Multimethod Analysis of Variance of Global Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	143	2.246	4.597*	.293	.250
I x S	286	.862	1.764*	.187	.159
I x T	143	1.096	2.244*	.202	.173
Error	286	.488		.488	

Note. Number of job incumbents = 144. Number of rater sources = 3. Number of traits = 2. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-28. **Jet Engine Mechanics (AFS 426X2): Multitrait-Multimethod Analysis of Variance of Global Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	217	2.386	5.601*	.327	.280
I x S	434	.965	2.266*	.270	.231
I x T	217	.859	2.018*	.144	.124
Error	434	.426		.426	

Note. Number of job incumbents = 218. Number of rater sources = 3. Number of traits = 2. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-29. **Aerospace Ground Equipment Mechanics (AFS 423X5): Multitrait-Multimethod Analysis of Variance of Global Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	256	2.635	6.939*	.376	.328
I x S	512	1.017	2.678*	.319	.278
I x T	256	.593	1.560*	.071	.062
Error	512	.380		.380	

Note. Number of job incumbents = 257. Number of rater sources = 3. Number of traits = 2. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-30. **Aircrew Life Support Specialists (AFS 122X0): Multitrait-Multimethod Analysis of Variance of Global Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	223	2.407	5.320*	.326	.290
I x S	446	1.085	2.398*	.316	.281
I x T	223	.545	1.204	.031	.027
Error	446	.452		.452	

Note. Number of job incumbents = 224. Number of rater sources = 3. Number of traits = 2. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.
*p < .01.

Table D-31. **Personnel Specialists (AFS 732X0): Multitrait-Multimethod Analysis of Variance of Global Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	210	2.026	4.026*	.254	.216
I x S	420	.955	1.898*	.226	.192
I x T	210	1.086	2.158*	.194	.165
Error	420	.503		.503	

Note. Number of job incumbents = 211. Number of rater sources = 3. Number of traits = 2. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.

*p < .01.

Table D-32. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Multitrait-Multimethod Analysis of Variance of Global Ratings**

Source	df	MS	F-Ratio	VC	ICC
I	167	2.220	4.892*	.294	.250
I x S	334	.988	2.177*	.267	.227
I x T	167	.933	2.057*	.160	.136
Error	334	.454		.454	

Note. Number of job incumbents = 168. Number of rater sources = 3. Number of traits = 2. VC, Variance component; ICC, Intraclass correlation coefficient; I, Job incumbents; I x S, Job incumbents by rater sources; I x T, Job incumbents by traits.

*p < .01.

APPENDIX E: CORRELATIONS BETWEEN ASVAB PREDICTORS AND JOB PERFORMANCE MEASURES, FACTORS, AND TRAINING SCHOOL GRADES (UNCORRECTED FOR RESTRICTION)

Table E-1. **Air Traffic Control Operators (AFS 272X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Uncorrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A	G[a]	E	Subtests[b]
TECH	.106	.113	.053	.128	.082	.276
SUPER	.039	.111	.065	.047	.041	.354*
SELF	-.086	-.017	-.022	-.093	-.114	.301
PEER	.042	.161	.048	.069	.058	.333
INPERS	-.041	.016	.035	-.005	-.069	.331
TOTWTPT	.109	.146	.055	.146	.095	.276
Hands-on	.066	.157	.052	.092	.075	.302
Interview	.131	.064	.049	.149	.081	.264
TGRD	.421**	.193*	.229*	.416**	.343**	.454**

Note. N = 157. Abbreviations are: AFQT, Armed Forces Qualification Test; M, Mechanical; A, Administrative; G, General; E, Electronics; TOTWTPT, Total score obtained with Walk-Through Performance Testing; and TGRD, Grade received in technical training.

[a]Composite used for selection into the specialty.

[b]The values reported for the subtests are multiple correlations.

*$p < .05$.

**$p < .01$.

Table E-2. **Avionic Communications Specialists (AFS 328X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Uncorrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A	G	E[a]	Subtests[b]
TECH	.334*	.295*	-.015	.296*	.317*	.555**
SUPER	.175	.180	.083	.173	.216	.353
SELF	-.019	.096	-.038	.041	.048	.363
PEER	.145	.005	.041	.179	.135	.301
INPERS	.138	-.053	.130	.179	.065	.414
TOTWTPT	.362**	.286*	.003	.323*	.308*	.562**
Hands-on	.281*	.289*	.025	.231	.298*	.454
Interview	.319*	.248	-.046	.299*	.277*	.581**
TGRD	.532**	.350*	.274*	.431**	.543**	.661**

Note. N = 74. Abbreviations are: AFQT, Armed Forces Qualification Test; M, Mechanical; A, Administrative; G, General; E, Electronics; TOTWTPT, Total score obtained with Walk-Through Performance Testing; and TGRD, Grade received in technical training.

[a]Composite used for selection into the specialty.

[b]The values reported for the subtests are multiple correlations.

*$p < .05$.

**$p < .01$.

Table E-3. **Information Systems Radio Operators (AFS 492X1): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Uncorrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A[a]	G	E	Subtests[b]
TECH	.374**	.254*	-.049	.370**	.316**	.480**
SUPER	.277*	.290*	.094	.247*	.284*	.449*
SELF	.157	.071	.102	.144	.149	.382
PEER	.360**	.310**	.051	.312**	.343**	.434*
INPERS	.194	.137	.060	.162	.158	.444*
TOTWTPT	.365**	.236*	-.047	.364**	.302*	.459*
Hands-on	.314**	.188	-.073	.329**	.251*	.417
Interview	.397**	.298*	-.016	.370**	.351**	.537**
TGRD	.604**	.509**	.228	.607**	.572**	.664**

Note. N = 97. Abbreviations are: AFQT, Armed Forces Qualification Test; M, Mechanical; A, Administrative; G, General; E, Electronics; TOTWTPT, Total score obtained with Walk-Through Performance Testing; and TGRD, Grade received in technical training.

[a]Composite used for selection into the specialty.

[b]The values reported for the subtests are multiple correlations.

*$p < .05$.

**$p < .01$.

Table E-4. **Jet Engine Mechanics (AFS 426X2): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Uncorrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M[a]	A	G	E	Subtests[b]
TECH	.178	.208*	.152	.227*	.217*	.348*
SUPER	.044	.070	.080	.069	.089	.228
SELF	.040	.086	.057	.007	.118	.334*
PEER	.106	.049	.140	.131	.092	.210
INPERS	.076	.026	.132	.088	.065	.205
TOTWTPT	.138	.186*	.148	.187*	.176	.334*
Hands-on	.086	.149	.126	.136	.125	.324
Interview	.214*	.208*	.137	.249**	.243**	.310
TGRD	.529**	.470**	.392**	.517**	.544**	.606**

Note. N = 166. Abbreviations are: AFQT, Armed Forces Qualification Test; M, Mechanical; A, Administrative; G, General; E, Electronics; TOTWTPT, Total score obtained with Walk-Through Performance Testing; and TGRD, Grade received in technical training.

[a]Composite used for selection into the specialty.

[b]The values reported for the subtests are multiple correlations.

*$p < .05$.

**$p < .01$.

Table E-5. **Aerospace Ground Equipment Mechanics (AFS 423X5): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Uncorrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M[a]	A	G	E	Subtests[b]
TECH	.241**	.423**	.111	.227**	.365**	.513**
SUPER	-.011	.076	.023	-.003	.029	.176
SELF	-.069	.239**	.160*	-.090	.052	.395**
PEER	-.074	.188**	.018	-.027	-.007	.301*
INPERS	-.047	.059	.042	-.045	-.015	.171
TOTWTPT	.154*	.317**	.038	.140*	.287**	.438**
Hands-on	.191**	.334**	.046	.179**	.322**	.463**
Interview	.084	.280**	.023	.078	.192**	.362**
JKTSCORE	.348**	.453**	.233**	.332**	.408**	.544**
TGRD	.265**	.373**	.216**	.255**	.338**	.477**

Note. N = 202. Abbreviations are: AFQT, Armed Forces Qualification Test; M, Mechanical; A, Administrative; G, General; E, Electronics; TOTWTPT, Total score obtained with Walk-Through Performance Testing; and TGRD, Grade received in technical training.

[a]Composite used for selection into the specialty.

[b]The values reported for the subtests are multiple correlations.

*$p < .05$.

**$p < .01$.

Table E-6. **Aircrew Life Support Specialists (AFS 122X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Uncorrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A	G[a]	E	Subtests[b]
TECH	.146	.272**	-.046	.162*	.180*	.317
SUPER	.136	.098	.042	.091	.091	.239
SELF	-.108	-.015	-.132	-.146	-.088	.262
PEER	.117	.045	-.115	.055	.096	.313
INPERS	.062	.016	-.109	-.023	.063	.304
TOTWTPT	.088	.167*	-.052	.099	.130	.206
Hands-on	.088	.167*	-.052	.099	.130	.206
Interview	.096	.261**	-.113	.096	.152	.334
JKTSCORE	.175*	.270**	.023	.199**	.169*	.363*
TGRD	.458**	.312**	.179*	.452**	.408**	.486**

Note. N = 157. Abbreviations are: AFQT, Armed Forces Qualification Test; M, Mechanical; A, Administrative; G, General; E, Electronics; TOTWTPT, Total score obtained with Walk-Through Performance Testing; and TGRD, Grade received in technical training.

[a]Composite used for selection into the specialty.

[b]The values reported for the subtests are multiple correlations.

*$p < .05$.

**$p < .01$.

Table E-7. **Personnel Specialists (AFS 732X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Uncorrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A[a]	G	E	Subtests[b]
TECH	.321**	.144	.179*	.326**	.221**	.387**
SUPER	.115	.102	.087	.127	.089	.303
SELF	-.044	.019	.145	-.049	-.024	.317
PEER	.178*	.087	.174*	.176*	.125	.304
INPERS	.108	.098	.092	.131	.089	.248
TOTWTPT	.252**	.126	.168*	.256**	.164*	.327
Hands-on	.245**	.148	.135	.227**	.196**	.291
Interview	.185**	.038	.124	.223**	.092	.308
JKTSCORE	.294**	.126	.137	.290**	.202**	.377**
TGRD	.466**	.202**	.232**	.472**	.350**	.510**

Note. N = 167. Abbreviations are: AFQT, Armed Forces Qualification Test; M, Mechanical; A, Administrative; G, General; E, Electronics; TOTWTPT, Total score obtained with Walk-Through Performance Testing; and TGRD, Grade received in technical training.

[a]Composite used for selection into the specialty.

[b]The values reported for the subtests are multiple correlations.

*$p < .05$.

**$p < .01$.

Table E-8. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Uncorrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A	G	E[a]	Subtests[b]
TECH	.334**	.328**	.226**	.345**	.418**	.552**
SUPER	.101	.156	.167	.082	.063	.265
SELF	.135*	.252**	.234**	.142	.126	.503**
PEER	.272**	.237**	.364**	.320**	.248**	.458**
INPERS	.066	.084	.188*	.064	-.034	.309
TOTWTPT	.307**	.236**	.210**	.310**	.365**	.503**
Hands-on	.296**	.229**	.206*	.299**	.351**	.498**
Interview	.215**	.286**	.176*	.254**	.280**	.396*
JKTSCORE	.306**	.385**	.174	.310**	.415**	.560**
TGRD	.377**	.420**	.224**	.309**	.438**	.626**

Note. N = 123. Abbreviations are: AFQT, Armed Forces Qualification Test; M, Mechanical; A, Administrative; G, General; E, Electronics; TOTWTPT, Total score obtained with Walk-Through Performance Testing; and TGRD, Grade received in technical training.

[a]Composite used for selection into the specialty.

[b]The values reported for the subtests are multiple correlations.

*$p < .05$.

**$p < .01$.

APPENDIX F: CORRELATIONS BETWEEN ASVAB PREDICTORS AND JOB PERFORMANCE MEASURES, FACTORS, AND TRAINING SCHOOL GRADES (CORRECTED FOR RESTRICTION)

Table F-1. **Air Traffic Control Operators (AFS 272X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Corrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A	G[a]	E	Subtests[b]
TECH	.175	.177	.119	.185	.188	.343
SUPER	.062	.096	.041	.065	.077	.395*
SELF	-.144	-.108	-.120	-.148	-.178	.375
PEER	.117	.174	.085	.126	.133	.386
INPERS	-.080	-.059	-.072	-.069	-.085	.369
TOTWTPT	.214	.235	.152	.230	.232	.360
Hands-on	.072	.156	.047	.048	.115	.356
Interview	.248	.177	.171	.255	.234	.359
TGRD	.755**	.546*	.648*	.753**	.705**	.768**

Note. Statistical significance reported for uncorrected correlations is inferred for corrected correlations.
[a]Composite used for selection into the specialty.
[b]The values reported for the subtests are multiple correlations.
*$p < .05$.
**$p < .01$.

Table F-2. **Avionic Communications Specialists (AFS 328X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Corrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A	G	E[a]	Subtests[b]
TECH	.635*	.589*	.437	.613*	.655*	.778**
SUPER	.391	.389	.297	.381	.431	.570
SELF	-.034	.174	-.065	-.003	.061	.469
PEER	.246	.153	.154	.252	.273	.422
INPERS	.214	.055	.181	.214	.184	.552
TOTWTPT	.668**	.588*	.469	.645*	.668*	.789**
Hands-on	.612*	.576*	.448	.585	.633*	.724
Interview	.580*	.531	.376	.566*	.597*	.764**
TGRD	.881**	.696*	.754*	.853**	.876**	.921**

Note. Statistical significance reported for uncorrected correlations is inferred for corrected correlations.
[a]Composite used for selection into the specialty.
[b]The values reported for the subtests are multiple correlations.
*$p < .05$.
**$p < .01$.

Table F-3. **Information Systems Radio Operators (AFS 492X1): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Corrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A[a]	G	E	Subtests[b]
TECH	.288**	.223*	.056	.298**	.250**	.542**
SUPER	.550*	.466*	.488	.558*	.516*	.664*
SELF	.443	.283	.445	.447	.425	.606
PEER	.463**	.388**	.328	.456**	.432**	.543*
INPERS	.484	.316	.434	.491	.401	.661*
TOTWTPT	.277**	.212*	.048	.288**	.246*	.510*
Hands-on	.191**	.144	-.031	.209**	.171*	.464
Interview	.358**	.280*	.142	.358**	.305**	.611**
TGRD	.790**	.651**	.658	.788**	.754**	.823**

Note. Statistical significance reported for uncorrected correlations is inferred for corrected correlations.
[a]Composite used for selection into the specialty.
[b]The values reported for the subtests are multiple correlations.
*$p < .05$.
**$p < .01$.

Table F-4. **Jet Engine Mechanics (AFS 426X2): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Corrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M[a]	A	G	E	Subtests[b]
TECH	.375	.421*	.312	.402*	.417*	.502*
SUPER	.119	.154	.130	.129	.157	.260
SELF	-.010	.114	-.044	-.026	.084	.411*
PEER	.216	.164	.241	.227	.201	.280
INPERS	.166	.119	.202	.171	.155	.256
TOTWTPT	.332	.383*	.298	.359*	.369	.472*
Hands-on	.229	.306	.218	.257	.272	.420
Interview	.414*	.424*	.322	.434**	.446**	.488
TGRD	.785**	.736**	.680**	.783**	.791**	.830**

Note. Statistical significance reported for uncorrected correlations is inferred for corrected correlations.
[a]Composite used for selection into the specialty.
[b]The values reported for the subtests are multiple correlations.
*$p < .05$.
**$p < .01$.

Table F-5. **Aerospace Ground Equipment Mechanics (AFS 423X5): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Corrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M[a]	A	G	E	Subtests[b]
TECH	.559**	.684**	.442	.556**	.647**	.729**
SUPER	.041	.128	.028	.046	.084	.223
SELF	.220	.437**	.236*	.218	.320	.528**
PEER	.040	.242**	.027	.061	.110	.362*
INPERS	-.005	.082	.008	-.003	.031	.205
TOTWTPT	.352*	.502**	.250	.348*	.456**	.588**
Hands-on	.404**	.546**	.285	.400**	.512**	.632**
Interview	.267	.427**	.192	.267	.351**	.489**
JKTSCORE	.736**	.763**	.634**	.734**	.771**	.821**
TGRD	.654**	.684**	.578**	.654**	.696**	.748**

Note. Statistical significance reported for uncorrected correlations is inferred for corrected correlations.
[a]Composite used for selection into the specialty.
[b]The values reported for the subtests are multiple correlations.
*$p < .05$.
**$p < .01$.

Table F-6. **Aircrew Life Support Specialists (AFS 122X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Corrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A	G[a]	E	Subtests[b]
TECH	.212	.304**	.115	.221*	.252*	.357
SUPER	.269	.192	.232	.245	.227	.340
SELF	-.434	-.294	-.423	-.449	-.393	.493
PEER	.044	-.007	-.075	.016	.025	.333
INPERS	-.127	-.115	-.195	-.165	-.119	.336
TOTWTPT	.145	.202*	.067	.153	.177	.242
Hands-on	.145	.202*	.067	.153	.177	.242
Interview	.026	.165**	-.071	.027	.080	.318
JKTSCORE	.300*	.361**	.226	.310**	.323*	.435*
TGRD	.706**	.587**	.593*	.702**	.689**	.719**

Note. Statistical significance reported for uncorrected correlations is inferred for corrected correlations.
[a]Composite used for selection into the specialty.
[b]The values reported for the subtests are multiple correlations.
*$p < .05$.
**$p < .01$.

Table F-7. **Personnel Specialists (AFS 732X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Corrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A[a]	G	E	Subtests[b]
TECH	.639**	.408	.583*	.637**	.564**	.667**
SUPER	.171	.165	.130	.178	.170	.358
SELF	.303	.211	.418	.299	.260	.485
PEER	.399*	.282	.378*	.400*	.363	.482
INPERS	.338	.273	.321	.348	.314	.410
TOTWTPT	.547**	.365	.510*	.547**	.482*	.581
Hands-on	.458**	.333	.396	.451**	.426**	.481
Interview	.509**	.286	.499	.517**	.429	.569
JKTSCORE	.601**	.371	.538	.595**	.523**	.638**
TGRD	.719**	.472**	.613**	.719**	.660**	.738**

Note. Statistical significance reported for uncorrected correlations is inferred for corrected correlations.
[a]Composite used for selection into the specialty.
[b]The values reported for the subtests are multiple correlations.
*$p < .05$.
**$p < .01$.

Table F-8. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Correlations Between ASVAB Predictors and Job Performance Measures, Factors, and Training School Grades (Corrected for Restriction)**

Job Performance Measures	ASVAB Predictors					
	AFQT	M	A	G	E[a]	Subtests[b]
TECH	.736**	.697**	.600**	.741**	.798**	.840**
SUPER	.260	.263	.309	.247	.236	.399
SELF	.435*	.409**	.446**	.402	.409	.654**
PEER	.727**	.602**	.723**	.738**	.706**	.785**
INPERS	.176	.134	.292*	.172	.105	.428
TOTWTPT	.680**	.617**	.552**	.685**	.736**	.790**
Hands-on	.657**	.605**	.532*	.662**	.716**	.778**
Interview	.694**	.652**	.604*	.704**	.726**	.760*
JKTSCORE	.720**	.720**	.570	.719**	.789**	.833**
TGRD	.806**	.723**	.683**	.794**	.814**	.884**

Note. Statistical significance reported for uncorrected correlations is inferred for corrected correlations.
[a]Composite used for selection into the specialty.
[b]The values reported for the subtests are multiple correlations.
*$p < .05$.
**$p < .01$.

APPENDIX G: ROY-BARGMAN STEP-DOWN TESTS (UNCORRECTED FOR RESTRICTION)

Table G-1. **Air Traffic Control Operators (AFS 272X0): Summary of Roy-Bargman Step-Down Tests (Uncorrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	160	673.40	355.62	1.89*
	TGRD	10	159	116.76	28.38	4.11**
2	Hands-on	10	160	334.17	160.44	2.08*
	Interview	10	159	137.62	69.07	1.99*
	TGRD	10	158	114.37	28.55	4.00**
3	TGRD	10	160	121.07	28.24	4.29**
	TOTWTPT	10	159	626.36	57.44	1.75
4	TGRD	10	160	121.07	28.24	4.29**
	Hands-on	10	159	327.18	161.44	2.03*
	Interview	10	158	126.31	69.40	1.82
5	TGRD	10	160	121.07	28.24	4.29**
	Interview	10	159	337.06	206.28	1.63
	Hands-on	10	158	120.28	54.31	2.21*

Note. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.
*$p < .05$.
**$p < .01$.

Table G-2. **Avionic Communications Specialists (AFS 328X0): Summary of Roy-Bargman Step-Down Tests (Uncorrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	75	1444.18	378.89	3.81**
	TGRD	10	74	78.24	16.30	4.80**
2	Hands-on	10	75	486.90	175.37	2.78**
	Interview	10	74	183.51	151.45	1.21
	TGRD	10	73	79.86	16.35	4.88**
3	TGRD	10	75	84.20	16.17	5.21**
	TOTWTPT	10	74	1321.60	381.89	3.46**
4	TGRD	10	75	84.20	16.17	5.21**
	Hands-on	10	74	436.33	177.26	2.46*
	Interview	10	73	197.73	151.47	1.30
5	TGRD	10	75	84.20	16.17	5.21**
	Interview	10	74	667.48	236.29	2.82**
	Hands-on	10	73	113.58	113.63	1.00

Note. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.
*$p < .05$.
**$p < .01$.

Table G-3. **Information Systems Radio Operators (AFS 492X1): Summary of Roy-Bargman Step-Down Tests (Uncorrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	97	1899.82	710.76	2.67**
	TGRD	10	96	149.12	25.63	5.82**
2	Hands-on	10	97	953.16	419.61	2.27*
	Interview	10	96	327.26	128.40	2.55**
	TGRD	10	95	139.26	25.52	5.46**
3	TGRD	10	97	231.80	28.66	8.09**
	TOTWTPT	10	96	714.90	635.60	1.12
4	TGRD	10	97	231.80	28.66	8.09**
	Hands-on	10	96	418.81	387.77	1.08
	Interview	10	95	241.32	132.72	1.95*
5	TGRD	10	97	231.80	28.66	8.09**
	Interview	10	96	450.62	268.32	1.68
	Hands-on	10	95	239.97	178.79	1.34

Note. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.
*p < .05.
**p < .01.

Table G-4. **Jet Engine Mechanics (AFS 426X2): Summary of Roy-Bargman Step-Down Tests (Uncorrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	177	436.57	224.07	1.95*
	TGRD	10	176	258.96	29.47	8.79**
2	Hands-on	10	177	196.62	105.46	1.86
	Interview	10	176	104.36	107.65	.97
	TGRD	10	175	260.11	29.36	8.86**
3	TGRD	10	177	384.30	30.20	9.41**
	TOTWTPT	10	176	332.55	218.69	1.52
4	TGRD	10	177	284.30	30.20	9.41**
	Hands-on	10	176	177.32	101.98	1.74
	Interview	10	175	82.50	108.26	.76
5	TGRD	10	177	284.30	30.20	9.41**
	Interview	10	176	140.08	142.61	.98
	Hands-on	10	175	116.55	77.41	1.50

Note. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.
*p < .05.
**p < .01.

Table G-5. **Aerospace Ground Equipment Mechanics (AFS 423X5): Summary of Roy-Bargman Step-Down Tests (Uncorrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	204	2117.63	461.40	4.59**
	TGRD	10	203	85.31	19.56	4.36**
2	Hands-on	10	204	1012.93	195.01	5.19**
	Interview	10	203	90.20	112.41	.63
	TGRD	10	202	81.10	19.58	4.14**
3	TGRD	10	204	122.31	20.29	6.03**
	TOTWTPT	10	203	1342.98	444.74	3.02**
4	TGRD	10	204	122.31	20.29	6.03**
	Hands-on	10	203	635.78	187.93	3.38**
	Interview	10	202	90.64	112.56	.80
5	TGRD	10	204	122.31	20.29	6.03**
	Interview	10	203	368.44	189.07	1.95*
	Hands-on	10	202	241.60	111.88	2.16*

Note. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.
*$p < .05$.
**$p < .01$.

Table G-6. **Aircrew Life Support Specialists (AFS 122X0): Summary of Roy-Bargman Step-Down Tests (Uncorrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	161	324.43	317.21	1.02
	TGRD	10	160	70.62	17.83	3.96**
2	Hands-on	10	161	324.43	317.21	1.02
	Interview	10	160	97.20	60.20	1.61
	TGRD	10	159	69.85	17.94	3.89**
3	TGRD	10	161	73.71	17.75	4.15**
	TOTWTPT	10	160	279.46	318.52	.56
4	TGRD	10	161	73.71	17.75	4.15**
	Hands-on	10	160	279.46	318.52	.88
	Interview	10	159	94.90	60.58	1.57
5	TGRD	10	161	73.71	17.75	4.15**
	Interview	10	160	182.63	90.03	2.03*
	Hands-on	10	159	96.75	214.30	.45

Note. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.
*$p < .05$.
**$p < .01$.

Table G-7. **Personnel Specialists (AFS 732X0): Summary of Roy-Bargman Step-Down Tests (Uncorrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	166	934.31	390.85	2.39*
	TGRD	10	165	125.68	22.42	5.60**
2	Hands-on	10	166	804.72	391.44	2.06*
	Interview	10	165	293.85	228.30	1.29
	TGRD	10	164	118.94	21.44	5.55**
3	TGRD	10	166	146.53	22.37	6.65**
	TOTWTPT	10	165	639.98	391.70	1.63
4	TGRD	10	166	146.53	22.37	6.55**
	Hands-on	10	165	371.68	380.18	.98
	Interview	10	164	360.26	225.32	1.60
5	TGRD	10	166	146.53	22.37	6.65**
	Interview	10	165	427.46	239.95	1.78
	Hands-on	10	164	288.27	357.00	.81

Note. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.
*$p < .05$.
**$p < .01$.

Table G-8. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Summary of Roy-Bargman Step-Down Tests (Uncorrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	115	1132.38	289.68	3.91*
	TGRD	10	114	104.06	17.51	5.94*
2	Hands-on	10	115	1071.48	282.80	3.79*
	Interview	10	114	39.39	25.30	1.56
	TGRD	10	113	99.26	17.51	5.67*
3	TGRD	10	115	133.69	18.80	7.11*
	TOTWTPT	10	114	798.24	269.85	2.96*
4	TGRD	10	115	133.69	18.80	7.11*
	Hands-on	10	114	758.32	263.74	2.88*
	Interview	10	113	34.12	25.28	1.35
5	TGRD	10	115	133.69	18.80	7.11*
	Interview	10	114	45.56	28.33	1.61
	Hands-on	10	113	607.71	235.32	2.58*

Note. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.
*$p < .01$.

APPENDIX H: ROY-BARGMAN STEP-DOWN TESTS (CORRECTED FOR RESTRICTION)

Table H-1. **Air Traffic Control Operators (AFS 272X0): Summary of Roy-Bargman Step-Down Tests (Corrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	146	784.60	61.40	2.17*
	TGRD	10	145	563.52	28.67	19.65**
2	Hands-on	10	146	346.04	163.58	2.12*
	Interview	10	145	275.09	73.03	3.77**
	TGRD	10	144	520.18	28.84	18.04**
3	TGRD	10	146	600.13	28.53	21.03**
	TOTWTPT	10	145	572.28	363.12	1.58
4	TGRD	10	146	600.13	28.53	21.03**
	Hands-on	10	145	334.89	164.62	2.03*
	Interview	10	144	176.79	73.35	2.41*
5	TGRD	10	146	600.13	28.53	21.03**
	Interview	10	145	292.29	213.63	1.37
	Hands-on	10	144	176.12	56.52	3.12*

Note. Statistical significance reported for uncorrected step-down tests is inferred for corrected tests. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.

*$p < .05$.

**$p < .01$.

Table H-2. **Avionic Communications Specialists (AFS 328X0): Summary of Roy-Bargman Step-Down Tests (Corrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	63	3410.08	328.52	10.38**
	TGRD	10	62	319.09	15.14	21.07**
2	Hands-on	10	63	1143.58	165.11	6.92**
	Interview	10	62	426.97	133.45	3.20**
	TGRD	10	61	337.00	15.08	22.34**
3	TGRD	10	63	538.24	15.30	35.17**
	TOTWTPT	10	62	1550.12	325.10	4.77**
4	TGRD	10	63	538.24	15.30	35.17**
	Hands-on	10	62	494.24	165.57	2.98**
	Interview	10	61	417.31	131.20	3.18**
5	TGRD	10	63	538.24	15.30	35.17**
	Interview	10	62	1003.73	187.48	5.35**
	Hands-on	10	61	148.07	115.87	1.28

Note. Statistical significance reported for uncorrected step-down tests is inferred for corrected tests. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.

*$p < .05$.

**$p < .01$.

Table H-3. **Information Systems Radio Operators (AFS 492X1): Summary of Roy-Bargman Step-Down Tests (Corrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	86	2224.04	736.49	3.02**
	TGRD	10	85	439.56	26.92	16.33**
2	Hands-on	10	86	1014.96	430.49	2.36*
	Interview	10	85	608.27	121.97	4.99**
	TGRD	10	84	381.53	27.09	14.08**
3	TGRD	10	86	547.98	30.45	17.99**
	TOTWTPT	10	85	1528.96	651.01	2.35*
4	TGRD	10	86	547.98	30.45	17.99*
	Hands-on	10	85	881.61	391.54	2.25*
	Interview	10	84	384.32	119.28	3.32**
5	TGRD	10	86	547.98	30.45	17.99*
	Interview	10	85	870.39	265.37	3.28
	Hands-on	10	84	388.52	175.98	2.20

Note. Statistical significance reported for uncorrected step-down tests is inferred for corrected tests. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.

*$p < .05$.

**$p < .01$.

Table H-4. **Jet Engine Mechanics (AFS 426X2): Summary of Roy-Bargman Step-Down Tests (Corrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	155	964.81	217.30	4.44**
	TGRD	10	154	794.53	28.88	27.52**
2	Hands-on	10	155	350.50	105.38	3.33**
	Interview	10	154	299.56	111.49	2.69**
	TGRD	10	153	775.59	28.64	27.08**
3	TGRD	10	155	1021.60	29.82	34.26**
	TOTWTPT	10	154	496.61	202.73	2.45**
4	TGRD	10	155	1021.60	29.82	34.26**
	Hands-on	10	154	202.47	100.69	2.01*
	Interview	10	153	151.87	112.09	1.35
5	TGRD	10	155	1021.60	29.82	34.26**
	Interview	10	154	234.82	141.56	1.66
	Hands-on	10	153	135.42	79.73	1.70

Note. Statistical significance reported for uncorrected step-down tests is inferred for corrected tests. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.

*$p < .05$.

**$p < .01$.

Table H-5. **Aerospace Ground Equipment Mechanics (AFS 423X5): Summary of Roy-Bargman Step-Down Tests (Corrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	191	4747.90	479.49	9.90**
	TGRD	10	190	319.64	20.29	15.75**
2	Hands-on	10	191	2526.99	199.03	12.70**
	Interview	10	190	119.50	112.88	1.06
	TGRD	10	189	288.86	20.35	14.20**
3	TGRD	10	191	509.89	21.04	24.24**
	TOTWTPT	10	190	2009.31	460.32	4.36**
4	TGRD	10	191	509.89	21.04	24.24**
	Hands-on	10	190	1029.72	192.25	5.36**
	Interview	10	189	124.23	113.10	1.10
5	TGRD	10	191	509.89	21.04	24.24**
	Interview	10	190	508.84	193.56	2.63*
	Hands-on	10	189	406.48	112.26	3.62*

Note. Statistical significance reported for uncorrected step-down tests is inferred for corrected tests. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.

*p < .05.

**p < .01.

Table H-6. **Aircrew Life Support Specialists (AFS 122X0): Summary of Roy-Bargman Step-Down Tests (Corrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	146	280.71	307.51	.91
	TGRD	10	145	252.86	16.94	14.93**
2	Hands-on	10	146	280.71	307.51	.91
	Interview	10	145	88.37	60.36	1.46
	TGRD	10	144	252.81	17.05	14.83**
3	TGRD	10	146	263.92	16.87	15.64**
	TOTWTPT	10	145	183.72	308.72	.59
4	TGRD	10	146	263.92	16.87	15.64**
	Hands-on	10	145	183.72	308.72	.60
	Interview	10	144	88.39	60.76	1.45
5	TGRD	10	146	263.92	16.87	15.64**
	Interview	10	145	143.41	91.26	1.57*
	Hands-on	10	144	101.04	205.54	.49

Note. Statistical significance reported for uncorrected step-down tests is inferred for corrected tests. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.

*p < .05.

**p < .01.

Table H-7. **Personnel Specialists (AFS 732X0): Summary of Roy-Bargman Step-Down Tests (Corrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	156	3213.78	405.02	7.93*
	TGRD	10	155	275.96	22.44	12.30**
2	Hands-on	10	156	1889.52	402.84	4.69*
	Interview	10	155	1096.88	230.11	4.77
	TGRD	10	154	268.95	21.48	12.52**
3	TGRD	10	156	418.23	22.35	18.71**
	TOTWTPT	10	155	1450.45	406.63	3.57
4	TGRD	10	156	418.23	22.35	18.71**
	Hands-on	10	155	490.54	393.60	1.25
	Interview	10	154	1037.16	226.32	4.58
5	TGRD	10	156	418.23	22.35	18.71**
	Interview	10	155	1272.21	240.75	5.28
	Hands-on	10	154	259.12	370.02	.70

Note. Statistical significance reported for uncorrected step-down tests is inferred for corrected tests. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.

*p < .05.

**p < .01.

Table H-8. **Precision Measurement Equipment Laboratory Specialists (AFS 324X0): Summary of Roy-Bargman Step-Down Tests (Corrected for Restriction)**

Analysis		df		Mean Squares		
Set	Order	HYP	MSE	HYP	MSE	F-ratio
1	TOTWTPT	10	112	5521.42	297.05	18.59*
	TGRD	10	111	305.82	16.86	18.13*
2	Hands-on	10	112	4964.40	289.94	17.12*
	Interview	10	111	125.38	25.09	5.00
	TGRD	10	110	277.74	16.65	13.68*
3	TGRD	10	112	727.66	18.18	40.02*
	TOTWTPT	10	111	1625.69	275.56	5.90*
4	TGRD	10	112	727.66	18.18	40.02*
	Hands-on	10	111	1548.51	269.18	5.75*
	Interview	10	110	50.32	24.75	2.03
5	TGRD	10	112	727.66	18.18	40.02*
	Interview	10	111	82.85	27.66	3.00
	Hands-on	10	110	1103.71	240.83	4.58*

Note. Statistical significance reported for uncorrected step-down tests is inferred for corrected tests. Abbreviations are: HYP, Hypothesis; and MSE, Mean square error.

*p < .01.